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Industrial Statistics.

We are indebted to S. W. Huse & Co., publishers of *Vox Populi*, for the following industrial statistics of Lowell, Mass :—

The Middlesex Company make use, annually, of 2.000,000 teasels, 2,000,000 lbs. fine wool, 50,000 lbs. glue, $30,000 worth of dye stuffs, and $13,000 worth of soap.

In addition to the above, the Merrimack Manufacturing Co. use 1,000,000 lbs. of madder, 380,000 copperas, 60,000 alum, 50,000 sumac, 40,000 soap, and 45,000 indigo, per annum.

The Lowell Bleachery uses 40,000 lbs. indigo, and $30,000 worth of other dyeing materials, per year.

The population of Lowell in 1828 was 3,532. In 1840 it was 20,796. In 1850 it was 33,385. Increase in ten years, 12,289. Population of Lowell in 1855, 37,553.

The Lowell Machine Shop, located among the above mills, can furnish machinery complete for a mill of 6,000 spindles in three months.

The several manufacturing companies have established a hospital for the convenience and comfort of persons employed by them respectively when sick, which is under the superintendence of one of the best of surgeons and physicians.

In Lowell there are twelve great establishments, which have an aggregate capital stock of $13,900,000; they have 52 mills, including shops; run 394,344 spindles, and 11,889 looms. They employ 8,990 females, and 4,397 males. They manufacture 2,374,000 yards of cotton goods per week, 44,000 of woolens, and 25,000 of carpets. They use weekly 765,000 pounds of cotton, and 91,000 of wool, and consume annually 62,317 gallons of oil, and 20,000 of lard, 29,750 tuns of anthracite coal, 33,300 bushels of charcoal, and 1,649,000 lbs. of starch. The average produce of each loom weaving No. 14 yarn is 45 yards per day; weaving No. 30 yarn 33 yards per day.

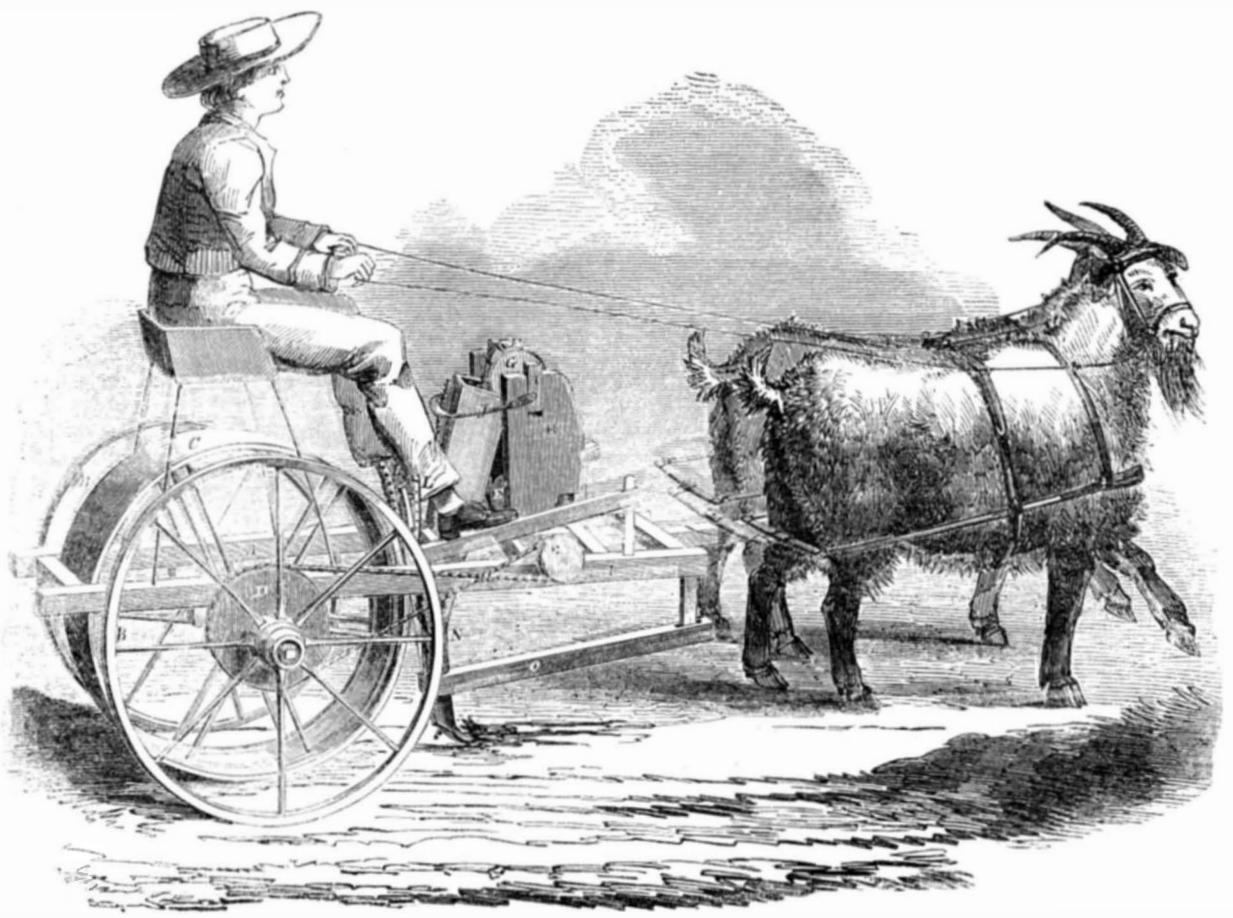
It is the water power of Lowell which, with the skill and energy of her citizens, have made it such a great manufacturing city. The factories although heated by steam are worked with water, there being no less than 34 breast wheels and 46 turbines employed—21 of these center-vent wheels. The total water power engaged for manufacturing purposes, we learn from Mr. Francis' work on Hydraulics, amounts to 8965 horse-power.

The Cotton Crop of 1856.

The Southern *Cultivator* says :—"In order to ascertain the extent of the crop, General McQueen, Member of Congress from South Carolina, adopted the happy and reliable expedient of addressing letters to the Representatives from the cotton-growing States, and from their several responses he has made up the estimate. According to his figures, the crop will not exceed 2,700,000 bales—about 800,000 bales short of last year."

George Carstensen, one of the designers and architects of the Crystal Palace in this city, died suddenly in his native city, Copenhagen, Denmark, on the 4th of January last.

HURD'S SEED DRILL.



The accompanying figures illustrate the Seed Sower of R. Hurd, of Moline, Ill.

Figure 1 is a perspective view of the machine at work on the broad prairie—it is drawn by an original, grave, and majestic, but, withal, a spanking team. Figure 2 is a vertical section of the machine.

The seed is kept in a box, and a series of small cups, on an endless belt, pass through it, carrying up the seed (a grain elevator,) and depositing it in a conveyor, from which it is conducted through the drill or spout, into the furrow in the rail, and then covered by a broad-faced wheel which follows after in the path of the drill.

A is the frame, which has two carriage wheels, B B; and a broad wheel, C, which follows directly behind the seed drill, pressing down the soil, and covering the seed. The seed box, H, is secured on the frame, and contains the seed, *a*. A small pulley, G, and another, E, are secured in the frame and rotate on spindles. An endless belt, having a series of small metal cups, F F, secured on it, rotate over these pulleys, as represented, lifting and carrying up the seed, elevator-like, and depositing it in the conveyer spout, whence it passes down into the drill. The seed box or hopper, *a*, has a bottom. *b*, secured to a spring, *c*, which allows it to open upwards when a seed bucket or cup passes into the box, and it prevents the seed falling out. The toe or share of the drill is secured to the hind end of bar O; the latter is pivoted to a vertical piece in front of the frame. The drill share is made to receive the tubular conveyer, N, and it is wide enough to be raised upon it a short distance to make furrows or drills of any depth desired. Two flat metal rods, L L, perforated with gauge holes, are secured—one at each side—to the bar O, and are held by pins in the cross bar, M, of a small frame, and thus the drill is set to any depth required. By raising these rods and securing the pin in one of their lower holes the toe of the drill may be raised to make a shallow drill, and *vice versa*. The bar, M, forms part of a small frame on the top of the truck frame, A. This frame is pivoted in a vertical standard at each side, (one is shown in fig. 1, placed a short distance in front of pulley, E'.) The longitudinal bar attached to it, extends to the back of the conveyer under the driver's feet, where it is connected to a cross piece, on which is the handle, M. By raising this handle, therefore, the driver can raise the drill share entirely out of the ground in an instant, to clear any obstruction. When it is desired to stop the seed from being deposited, the top axle of pulley, G, can be raised to tighten the elevator band to such a degree that it will not revolve; or it can be

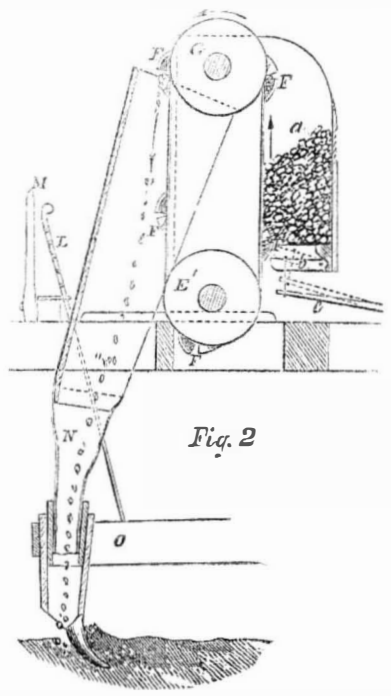


Fig. 2

lowered to slacken the band sufficiently so that it will not revolve. The bearings of the axle of the pulley, G, are set in movable boxes, I, in the prights, H; these movable boxes are secured to a metal *bail*, J, which is held in a graduated catch bar behind the top of the conveyer. By raising the bail, J, the belt of the seed conveyer is tightened; or it is slackened by depressing it; it can also be held at any suitable point by the catch rack.

As the machine is drawn forward, the elevator receives motion from the cord passing from pulley, D, on the carriage axle, around the lower pulley, E, of the elevator. The grain or seed is deposited with certainty by this machine, because the driver can always see whether or not the elevator discharges its seed into the conveyer of the drill. The seed cups operate with certainty to take up seed from box *a*, regularly and uniformly; they can also be set in greater or less number on the belt, to deposit more or less seed, as may be required to plant either in regular drills or in hills.

The patent was issued for this machine on the 25th Dec., 1855, the claim for which will be found on page 130, Vol. 11, SCIENTIFIC AMERICAN. At that period the patentee resided at Spring Hill, Ill., he now resides at Moline, in that State, to which place letters requesting further information should be directed.

Transatlantic Telegraph Company.

The stock of the company engaged in the mammoth enterprise of uniting Europe and America by telegraph amounts to seventeen hundred and fifty thousand dollars (1,750,000 It has been subscribed as follows, the shares being $5,000 each :—London capitalists take 101; Liverpool, 86; Glasgow, 37; Manchester, 28; other English towns, 10, and the balance, 88 shares, in America. America owns, therefore, $440,000, or a little more than one-fourth of the cable.

Although opposed to the calculations presented last week, we may mention that an experiment is obscurely reported to have been made by a Mr. Siemens, in which communication was effected as rapidly as twenty words per minute, through 3,000 miles of continuous wire cable above ground.

A factory for making oil from cotton seed is now in operation at India Point, near Providence, R. I.

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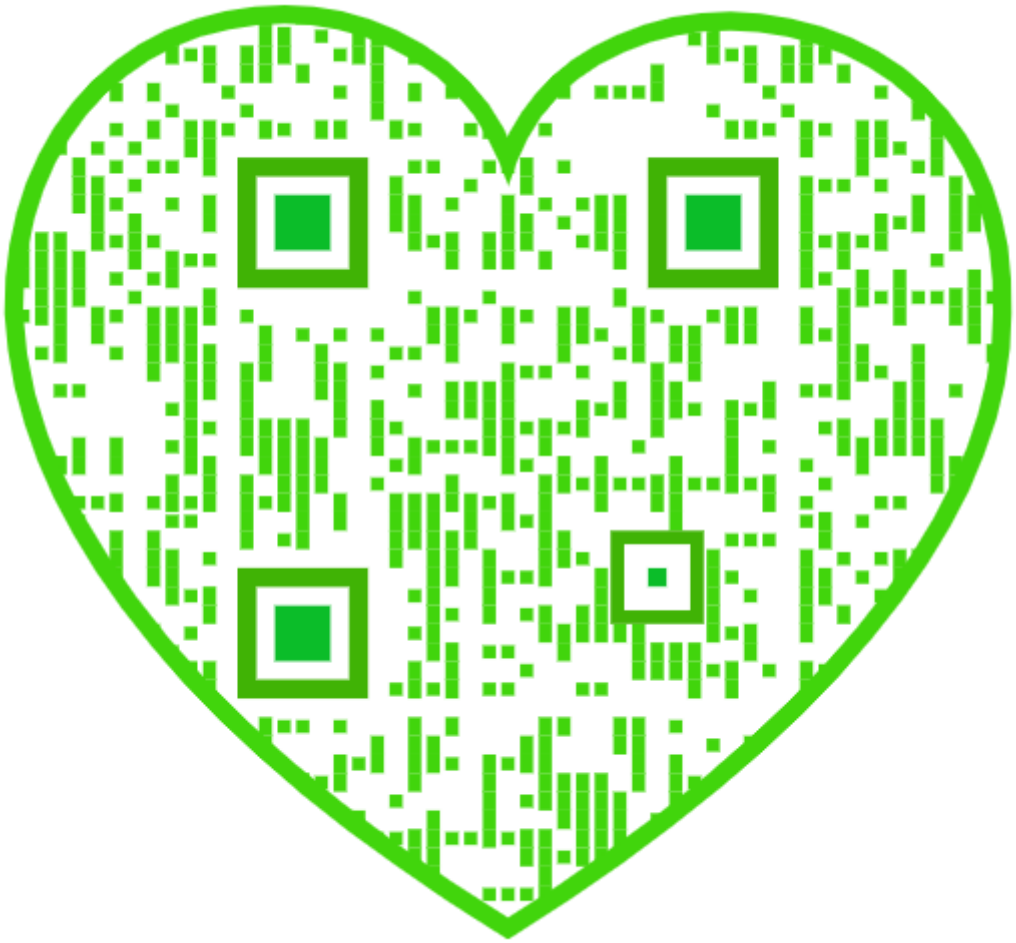

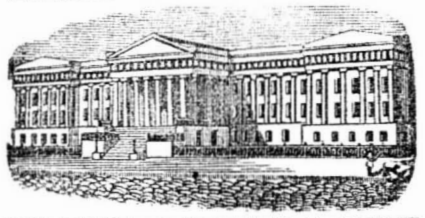

[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 10, 1857.

STUFFING LEATHER—Joseph Armstrong, of Woburn Center, Mass.: I do not claim the usual process of stuffing a wet hide or skin, in which process the moisture or water in the hide has to be removed by evaporation after the tallow or grease has been rubbed into the hide; nor do I claim stuffing wet hides by a fulling mill wherein by the percussive force of the beaters thereof the water or tan liquor is more or less forced out of the hides and the grease simultaneously driven into them as in this case desiccation of the hides by subsequent exposure to the atmosphere is necessary. Nor do I claim irrespective of my specific application of it, the use of a press to expel a liquid from an article or substance; nor do I claim the mere use of a peg-lined cylinder for the purpose of impregnating hides with grease, but as I have made an improvement in the process of currying by which I not only dispense with desiccation of the hides by evaporation induced by exposure of them to the atmosphere during the application of oil or grease to them, but also the handling and working or labor incident thereto, and perform the operation of expelling the water or tan liquor from them in much less time comparatively speaking—

I claim in the currying process, the same consisting in employing a press as stated previous to and in connection with the application of the oil or grease by a peg-lined cylinder or other equivalent means as set forth, the press removing the liquor and compacting the hide, and the peg-lined cylinder subsequently restoring or plumping it, and impregnating it with grease as explained.

MELODEONS—J. C. Briggs, of Woodbury, Conn.: I distinctly disclaim everything in my device which is similar to Swan's invention, or to Hamlin's, mentioned.

I do not confine myself to the particular means described of graduating the force of the spring, a, nor to the particular position of the expression chamber, relatively to the exterior of the wind reservoir and pump.

But I claim the expression chamber, C, with its valve, f, arranged and operating in the manner and for the purposes substantially as described.

[The expression chamber embraced in this improvement in melodeons controls the passage of air to the wind-receiver in such a manner as to give any expression to the instrument, to produce the softest tone perceptible to the ear, also the loudest which the instrument can execute. This chamber is not intended to be used as a substitute for the common 'swell," its object is to extend the powers of such instruments.]

FIRE ARMS—Francis S. Brettell and Joseph B. Frisbie, of Alleghany City, Pa.: We wish it understood that we do not confine our improvement to be used in revolving fire arms only, but the same may be used in any other class of fire arms.

We claim the arrangement of the pawl or catch, k, notch, b, and claw, m, on the hammer, and the cam, g, on the trigger, or any other arrangement substantially the same, for the purpose of keeping the hammer and the trigger in their respective positions when at full cock, as set forth.

MAKING ENVELOPES—Theodore Bergner, of Philadelphia, Pa.: I am well aware that jets of compressed air have been used to assist in folding envelopes, as is the case in the machine of M. Remond, which is unlike my invention.

I do not claim the folding hinges exclusively, a similar device having been used heretofore.

I am also aware that atmospheric pressure is claimed for holding the blank during the operation of folding, in Wm. H. Lowes' patent, April 8, 1856; but I claim—

First, Giving the sliding rod, D, a downward movement by means of link, E, lever, F', rod, G, and cam, H, in the manner and for the purpose set forth.

Second, Giving a sliding movement to the frame, V, by means of link, x, lever, W, rod, z, and cam, A', thereby operating by means of lifters, g, g, g, g, 2, the folding hinges, i, i, i, i, 2, in the manner described.

Third, The compartments, r, r, in combination with pipes, S, and cylinder, R, the latter being provided with piston t, 2, which is operated by cam, S, on the shaft, I, the whole being constructed substantially in the manner set forth.

Fourth, The stamp, P, working in the swivel bearing, O, and operated by cam, Q, pin, r, rod S, l, and cam, T, in the manner and for the purpose specified.

Fifth, The employment of cam, 4, lever 1, rod, Z, arm y, and spiral spring, 5, to turn s wivel bearing, O, on its axis, substantially in the manner and for the purpose set forth.

Sixth, Operating the parting vessels, 1 2, 1 2, by the lever, M 1, rod, n, and cam, N, substantially as described.

Seventh, Applying the curved arm, H, working in a slot, k, through the folder, P, for removing the finished envelopes to the inclined table, K, and operating it by rod, G, and cam arm, F, as shown.

ATTACHING THILLS TO SLEIGHS—J. M. Batchelor, of Foxcroft, Me.: I am aware that thills have been previously attached to sleighs in such a manner that the thills may be adjusted or moved to either side of the sleigh, but the modes previously adopted have been complicated and the thills could not be adjusted without considerable difficulty. My improvement is extremely simple, may be applied to sleighs at a small cost, and the thills may be adjusted with the greatest facility.

I claim attaching the thills, G, to the bar, E, which bar is fitted within a grooved bar, D, attached to the sleigh, the bar, E, being allowed to slide within the grooved bar, D, and secured at the desired points by the spring catch, H, substantially as described for the purpose set forth.

[By this improvement the thills of a cutter or sleigh can be adjusted and set at any point to suit the circumstances of the track. The thills of sleighs are generally secured permanently, and are incapable of being thus adjusted this improvement completely obviates this defect by a most convenient arrangement.]

EXTENSION HOPPERS FOR SEPARATORS, GRAIN MILLS, &c.—John Bean, of Hudson, Mich.: I claim the combination of an adjustable extension piece, a, with the hopper, B, in the manner and for the purposes substantially as set forth.

[This is a grass and grain separator, and possesses qualities desired by every farmer. By providing an extension hopper, with an adjustable end, also a shoe which has a screen and a fan, all arranged in a peculiar manner, this machine separates all the grass seed from the grain. The sound grain passes into one receptacle, the grass seed into another, and all foreign substances are thrown out.]

PRINTING STAMP—Wm. H. Elliot, of Plattsburg, N Y.: I do not claim the joint, H, as a stop for terminating or stopping any motion of the die carrier, B, around pin or center, K, and giving to said die carrier a new and distinct motion a device for this particular purpose being found in a hand stamp invented by Mr. P. A. Ramsey, of Boston. The principal object of joint, H, in my invention being to confine one portion of die carrier, B, as early as is requisite to a direct or longitudinal motion.

I claim, first, the crank, F, joint, H, or their equivalents, when used in combination with type or die, C.

Second, The same in combination with the treadle.

Third, The self-adjusting ink pad, E.

Fourth, Tilting the ink pad, E, so that by the action of the type or die upon it, it may be revolved.

Fifth, The combination of the die or type, C, with the crank, F, when arranged as specified in relation to the two pads.

SHOES FOR TRUSS FRAMES—Reuben Comins, of Troy, N. Y.: I claim furnishing that description of shoe which at the part where the braces rest is of an inverted, T, or angular, or curved form, with two projecting plates on its under side which in their horizontal section, are of T form, said plates passing through the stringers on each side of the vertical rods, and thus forming an opening or jaws for the vertical rods to pass between, and extending down from the surface of the shoe, which rests upon the stringers, to the nuts and washers upon the underside of the stringers, substantially as and for the purposes set forth.

[This invention is designed to prevent the end thrust of the diagonal braces on the bottom and top stringers of the frame. A metal shoe, with a central stop for the end of the diagonal braces to rest upon and butt against, is placed on the top of the lower stringer, and on the under side of the upper stringer. In each of the shoes, two T-shaped projections are cast to form jaws. These pass entirely through the stringers, and serve for the vertical screw strain rods to pass through, and for the nuts of the same to come against. With this arrangement the thrust of the vertical braces is removed from the stringers, and thrown upon the rods and shoes, and thus all liability of the stringers being crushed at the point where the strain comes upon them is avoided. This is an important improvement in the construction of heavy bridges.]

GUNPOWDER—Elisha B. Dodson, of Reading, Pa.: I claim the treatment of mineral coal, as described, preparatory to using the same as a substitute for charcoal in the manufacture of gunpowder and blasting powder, as set forth.

RAKING ATTACHMENT FOR REAPERS—Peter Harnist, of Marinetown, Ill.: I claim operating the rod, M, to which the rake head, L, is pivoted by means of rock shaft, N, arms, g, f, and connecting rods, P O, in combination with spring, Q, crank, K, and bar, S, when the same are constructed and arranged for joint operation, substantially in the manner and for the purpose set forth.

[By an arrangement of certain devices and gearing, the rake in this Harvester receives all the motions to perform the raking operations in a simple and correct manner. A reciprocating motion is given to the rake. also up and down and back and forth movements, whereby the grain is raked direct from the platform, and discharged, then the rake is brought forward for another operation.]

RAZOR STROPS—Edwd. K. Godfrey, of New York City: I claim the use of an independent strop stock, without handles, in combination with adjustable and independent backs, substantially for the purposes set forth.

ATTACHING THE EYES TO THE BLADES OF HOES—Henry Havell, of Newark, N. J.: I do not claim the individual parts of a hoe, neither do I claim welding the malleable iron eye to the blade.

But I claim the cap, A, which forms a socket with the blade, B, to receive the malleable iron eye, and becomes a part of the same, in the manner and for the purpose substantially as described.

SEED PLANTERS—Thos. B. Houghton, of Bloomington, Ill.: I claim operating the planting slide and tube by means of a crank receiving its motion from one or both of the carriage wheels, substantially in the manner described.

I also claim the reciprocating frame, x, or its equivalent so constructed and operated as to guide the planting tube, and make it deposit the seed in the ground at the desired point, substantially as described.

GUIDES FOR SEWING MACHINES—Addison Hull, of Brooklyn, N. Y.: I do not claim generally the attachment of the guide to the foot piece which presses on the cloth during the sewing operation.

I claim the attachment of the guide plate, C, to a spring bar, E, or its equivalent, which operates independently of the foot piece, A, holding the cloth during the sewing operation, and is adjustable laterally to the same, and the connection of the same by a vertically slotted connection, d, e, with a slotted sliding plate, C, working through the foot piece. A, substantially as described, whereby the guide plate is made adjustable and changeable, as set forth.

[In this sewing machine a guide is applied in connection with a foot piece which confines the cloth to the table, and admits of its being readily adjusted at any suitable distance from the needle, and renders it self-adjusting to cloth of various thicknesses while under operation. This improvement is simple, and efficient for the purpose.]

RAMMING PERCUSSION CAPS—Charles Hicks, of Haverstraw, N. Y.: I claim, first, the pistons, E E, arranged in a row and receiving reciprocating rectilinear and circular movements simultaneously operating in combination with the traveling carrying plate or other equivalent devices for carrying the caps, substantially as described.

Second, Producing the circular movement of the pistons by means of pinions, C C, on the said pistons, gearing with a toothed rack, G, that receives a sliding movement laterally to the frame which carries the pistons, and imparts to them the rectilinear movement from a lever, K, operated by a cam, J, on the crank shaft by which the rectilinear movement of the pistons is produced substantially as described.

Third, The employment of the stationary plate, W, in combination with the reciprocating pistons and the traveling carrying plate, F, substantially as and for the purpose set forth.

[A number of pistons having a reciprocating rectilinear motion, and a motion on their axes are combined in this machine, with suitable means of carrying a number of charged caps, and presenting them to these pistons, to be properly rammed with the percussion powder. By these improvements percussion caps are charged rapidly, and in a very superior manner.]

METHOD OF SURFACING FELT HATS—Alvin Hurd, of Danbury, Conn.: I claim surfacing the hat upon the elastic cover or bed for the purpose, and in the manner substantially as described.

FEATHERING PADDLE WHEELS—Lewis T. Howard, of Smith Mills, Miss: I claim connecting the cranks of the paddle shafts with each other around and with the stationary governing wheel, E, by means of the connecting bars, K K, and the grooved rollers, b b, or their equivalents, substantially as set forth.

SEED PLANTERS—John Hildebrand, of East Berlin, Pa.: I claim the combination of the above described spring connection, V and W, slides, L and M, scraper, T and U, and the vibrating head cam, O, when arranged for the purpose set forth.

GAS MAKING PROCESS—James Hansor, of Wandsworth Road, England: I claim the treatment of the compound gas fuel made in the manner described, and worked in the retorts as set forth.

SEED PLANTERS—Reinhold Boeklen, of Jersey City, N. J.: I claim the distributor, D, having chamber, l, and recesses, g, and worked between the compartments, b and c, by means of the link, E, and slide, C, in combination with the cut-off, E', and plate, F, the whole arranged and operating substantially in the manner and for the purpose set forth.

CONTROLLING THE THROTTLE VALVE OF MARINE ENGINES—Wm. H. Elliot, of Plattsburg, N. Y.: I do not claim regulating and controlling the supply of steam admitted to the cylinder of a marine engine by the varying pressure of the water, caused by the varying depths to which the vessel may be immersed.

Neither do I claim the devices employed by me for that purpose separate from the combination and arrangement in which I use them.

But I claim the chamber, A, cylinder, D, plunger, H, and spring, S, when arranged in relation to the engine and to the hull of the vessel and to each other, in the manner described and for the purposes set forth.

SMELTING ZINC-IRON ORE—Joseph C. Kent, of Cooper Iron Works, N. J.: I claim the peculiar process of alternating in the blast furnace the Franklinite and other ores of iron and zinc with ordinary ores of iron, for the production of cast-iron and oxyd of zinc, by which process I maintain the equilibrium of heat, and keep the furnace in successful operation, as described.

SAFETY INDICATORS FOR STEAM BOILERS—Lucius J. Knowles, of Warren, Mass.: I do not claim arranging and connecting a tubular or elongated vessel, C, with a steam boiler, substantially as described, in combination with so supporting the said vessel, C, at one end or part of it, and applying to it a lever or other proper means, that it may expand and contract, and operate said lever, or means, essentially in manner and for the purpose specified.

I claim connecting the pipe, I, with the boiler by means of the feed pipe, B, the same being productive of an advantage, as stated.

SEED PLANTERS—Jacob Landes, of Selma, O.: I disclaim the making of a seed cut-off with a concave face. I also disclaim the giving of a vertical movement to a cut-off, as both of these features are old.

I claim, pivoting the cut-off, G, to the bar, d, so that the cut-off shall have an oscillating movement, and thus stir the seed when it oscillates, in the manner and for the purposes set forth.

[In this seed planter there are adjustable clearing devices for removing clods and other obstacles in the path of the furrow shares, which is a good arrangement. The valves of the machine, to allow the seed to drop, are operated to receive a quick motion at the proper times for depositing the seed correctly in the furrows. The improvement is adapted for planting corn, or any other kind of grain. The seed is also stirred by a device. This is positively necessary for correct planting, especially when moist, steeped seed is used.]

FENCE ADAPTABLE TO UNEVEN GROUND—G. R. McIlroy, of Covington, Ky.: I claim the combination of the adjustable bar and oblique pin with an angularly braced panel and bearer, or any ordinary panel, as seen in figures 2 and 3, on which the angular or other bar may be supported, so that the panels may be moved sideways at the bottom, so as to bring them perpendicular upon uneven ground, and secured in that position by one or two adjustable bars or seats, substantially as described.

REAPING AND MOWING MACHINES—Jeremiah W. Mulley, of Amsterdam, N. Y.: I claim constructing and arranging the platform of combined reaping and mowing machines in parts, when one or more of said parts may occupy at pleasure such position in relation to the cutters as to form the track clearer for mowing, or the platform for reaping. in the manner substantially as set forth.

ORNAMENTING DAGUERREOTYPE CASES, &c.—John F. Mascher, of Philadelphia, Pa.: I claim the process of ornamenting daguerreotype cases or other articles in imitation of tortoise shell, wood, or marble, or other substances, by first covering the surfaces thereof with stained or colored paper of suitable character, or staining or coloring the surfaces themselves in a suitable manner, and afterwards coating them with gelatine and bi-chromate of potash, in any manner substantially as specified.

[This is a useful improvement for ornamenting the surfaces of the various articles mentioned. They are made to resemble tortoise shell, marbles, etc., by a very simple process, and are then rendered water-proof by a cheap chemical compound.]

PREPARING INDIA RUBBER CLOTH—Gulielmus B. Millerd, of Cochester, Conn.: I do not claim the process described of boiling caoutchouc in alkali, to desulphurize its surface, nor the buffing or grinding its surface to produce roughness thereon.

Neither do I claim the attachment of a sheet of caoutchouc to cloth, either in an extended state to produce an elastic fabric, or in a free state to produce an unelastic fabric, where the union is effected by the application of cement to the caoutchouc, or by subsequent vulcanization.

But I claim the application of a sheet of vulcanized caoutchouc, previously prepared by buffing its surface or surfaces, substantially as described, to a sheet of cloth or between two sheets of cloth previously prepared by being thinly coated with an unvulcanizable solution of caoutchouc on the tangent side or sides, the sheet of caoutchouc being applied in an extended state to produce an extensible and elastic, or in a free state to produce an inelastic fabric, by simple pressure, and without the use of cement or subsequent vulcanization.

ABDOMINAL SUPPORTER—Julia M. Milligan, of New Albany, Ind.: I claim the application of the whalebone or any other article substantially the same, and the cords or strings, as used in the manner described, by which the requisite mechanical support may be obtained.

CHAIN PUMPS—Edmund Morris, of Burlington, N. J.: I claim the application of an elastic flexible tube, arranged as set forth, in combination with the box or chamber in which it is enclosed, for the purpose of retaining water to assist in packing the pump, substantially as described.

GAUGES AND WATER REGULATORS FOR STEAM BOILERS—Michill Nutting, of Portland, Me.: I do not confine myself to the use of water as the fluid to fill the expanding chamber, as alcohol, air, or other fluids may be used for this purpose.

I claim the arrangement of the expanding chamber in relation to the opening for steam in the heating apartment, so that the steam from the boiler, when it is admitted to this apartment, is suddenly brought into contact with the surface of the lower part of the chamber, within the apartment, and remains in contact with the same until the water in the boiler rises to the top of the opening which admitted the steam when the contact of the steam with the chamber is suddenly cut off, as described.

RAIL FOR STREET RAILROADS—Samuel Nicolson, of Boston, Mass: I claim my street rail, constructed essentially as described, or with recesses in its side or sides for the reception of the paving blocks, each recess of one side being opposite either a recess of the other side or space between two recesses of the other side, essentially as explained.

SUSPENDING AND ADJUSTING STICKS IN SAWING MACHINES—Ezekiel Page, of Platea, Pa.: I am aware that it has been attempted to saw clap boards by revolving a log on the center over a circular saw, but this made straight parallel radial cuts, and would not answer for oars, and I am not aware that oars were ever sawed out radially from a log which is the only way to prevent warping, and is a very important feature in their manufacture discovered by me.

I claim constructing the head and tail blocks of a sawmill, in which the log is so suspended as to rotate, with the vertical and lateral adjustments arranged and combined as set forth, so that the log may be sawed radially and tapering, for the purpose of getting out oars therefrom, as specified.

VENTILATING STOVES—Luther M. Parsons, of Wawkau, Wis.: I do not claim separately the pipes, H, bent pipe, J, bar, K, with its valves, e, and expansion spiral rod, a', for these separately, or in themselves considered, have been previously used.

But I claim the arrangement of the pipes, H, bent pipe, J, bar, K, provided with valves, e, and the expansion rod, a', as shown and described, for the purpose specified.

[This stove is so constructed that the fire is fed with air from near the ceiling, where it is most impure in a room. Pure air is carried in from the outside of the building by a tube, and conducted into a heating chamber of the stove, and when it is sufficiently warmed is distributed through the room. The objects contemplated by this improvement are good, and embrace correct principles in heating and ventilation.]

HAND STAMP—Perley A. Ramsay, of Boston, Mass.: I do not claim stop, J', as a guide, for the purpose of guiding arm, G, or confining it to a longitudinal motion, several devices for that purpose being found in hand stamp invented by Wm. H. Elliot. The principal object of stop, J', in my invention being to terminate or stop the motion of arm, G, around axle, E, thereby causing said arm to take a new and distinct motion.

I claim the arm, G, pivoted to the truck, D, in combination with the stop, J', and ink roll, K, operating in the manner substantially as set forth.

Second, I claim the method described of hanging the ink roll, for the purpose set forth.

CORN PLANTERS—Martin Robbins, of Cincinnati, O. I claim the reversible hopper and arm with the vibrating claw or tappet, connected as described, with seeding mechanism, in combination with the jointed rod or chain provided with buttons or similar devices, for the purposes explained.

SEWING MACHINES—Thomas J. W. Robertson, of New York City: I claim the spiral groove in the needle leading upward from the eye on one side, in combination with the looper, in the manner and for the purpose described.

I also claim the loop guide, c, in combination with the looper for laying the loop, as described.

I also claim the guard pin, e, or its equivalent, for the purpose set forth.

SEED PLANTERS—Silas G. Randall, of Rockford, Ill.: I claim in combination with the shoe or spade, composed of the pieces, E f, the spreading bars, H, arranged and operating in the manner and for the purpose substantially as set forth.

ATTACHING THE ARMS OF HORSE POWERS—Cyrus Roberts, of Belleville, Ill.: I claim the combination of the radial rigid arms, and intermediate hinged and suspended sweeps with the master wheel, substantially as set forth.

ROTARY STEAM ENGINES—John B. Root, of Buffalo, N. Y.: First, I claim the central hub, A, when used as a support for friction rollers, in the manner and for the purpose set forth

Second, I claim the arrangement of friction rollers within the piston, H, upon the central hub, A, substantially in the manner described.

Third, I claim the piston, H, when used and acting upon friction rollers, substantially in the manner described.

Fourth, I claim the combination of the sliding frame, J, the self-adjustable boxes, i i, the driving ring, K, and the wedge, L, for the purpose of regulating the bearing of the friction rollers upon the piston, H, and central hub, A, substantially as set forth.

METALLIC ROOFING—Benjamin Ross and John C. Campbell, of Syracuse, N. Y.: We claim the method described of connecting together metallic plates or shingles for roofing by their own weight, when the series of plates so connected are fastened only at the upper and lower edge of the roof.

FACING MILL STONES—Benjamin D. Sanders, of Holliday's Cove, Va.: I do not claim any of the parts described used separately.

But I claim the instrument described, consisting of the slotted beam, C, cross arm, D, elastic pointer, i, box, B, carrying the adjusting screw, b, spindle, a, and adjustable base or stand, A, or the equivalent of these devices, constructed and arranged in relation to each other for joint operation, substantially in the manner for the purpose set forth.

SELF-ADJUSTING WIND WHEEL—Edward A. Tuttle, of Brooklyn, N. Y.: I do not claim a horizontally revolving wind wheel as such, or suspending them upon a second horizontal shaft simply.

I claim placing the sails, D D, or a greater number, in a position before the wind, as shown, and then causing them to perform complete rotations upon their axis, e e, in the time relatively with those of the wind wheel, and in the direction as specified, by connecting them with the crown wheel, E, in any manner producing the same result, for the purpose set forth.

I also claim the particular mechanism shown and described, viz., the crown wheel, E, and vane, v, connected with the sails, D D, by means of the pinion wheels, h h and l l, and wheels, F F, arranged in the manner substantially as shown for the purpose set forth.

I also claim combining with the horizontal rotary motion of the sails upon their axes, c c, the perpendicular adjustable vibratory motion described, by which they are rendered self-regulating in a most simple manner, although presenting reverse sides to the wind at each succeeding revolution of the wind wheel.

I also claim the method of assisting the sails to perform their rotations upon their axes, c c, by means of the reverse projecting rims, y y" upon the bottom edges, and operating in the manner described.

SEED PLANTERS—H. Thomason, of Lafayette, Ind.; I do not claim the slide, F, nor the mode of operating the slide by the wheel, I, with the pins, a', attached, and the bent lever, K, for these parts are well known.

Neither do I claim operating the slide, F, by hand, irrespective of the means shown and described for effecting the purpose.

But I claim operating the distributing device or slide, F, by means of the lever or rod, G, having the arm, e', attached to its fulcrum bar, d, which has a spring, e, connected with it, and the collar or tube, H, on the handle, C', of the implement. The collar or tube, H, being provided with an arm, h, extending underneath the arm, e', of the fulcrum bar, d, the whole being arranged substantially as shown and described for the purpose set forth.

[This improvement in seed planters relates to the distributing device, which is operated by the attendant. A movable tube is fitted on one of the handles of the implement, and this tube is provided with an arm which operates a lever connected with the distributing device. By this means the attendant having hold of the handles can operate the seed distributing device at pleasure. The seed can be planted either in drills or hills, as may be desired.]

HARVESTING MACHINES—Walter A. Wood, of Hoosick Falls, N. Y.: I claim making the raker's seat or stand adjustable in the arc of a circle on the rear part of the frame, substantially in the manner and for the purpose set forth.

HARVESTING MACHINES—Walter A. Wood, of Hoosick Falls, N. Y.: I claim in combination with the finger bar A, and shoe, C, a track clearer, E, hung to said bar by a spring, F, and playing vertically between, but resisted laterally by, the lugs, a a, on said shoe, when said parts are constructed and arranged in relation to each other, substantially as set forth.

HARVESTING MACHINES—Walter A. Wood, of Hoosick Falls, N. Y.: I claim connecting and disconnecting the gears, P Q, by a clutch lever, U, with its cam planes, and handle extending up through the support to a convenient position for the operator, and when made and operated in the manner and for the purpose set forth.

INDICATING THE HIGHT OF WATER IN THE HOLDS OF VESSELS—Wm. R. Warden, of Boston, Mass.: I claim operating the alarm apparatus, situated as described, by means of the balls, W, ball carrier V, inclined tube E, and lever, i, with their co-operating mechanism, the whole operating together in the manner as set forth.

WOOL CLEANING MACHINES—William H. Watrous, of Brooklyn, N. Y.: I do not claim the picker cylinder, the fan blower, or the reciprocating screen, and the devices for operating the same individually, as these have all been applied for analogous purposes.

But I claim the combination of the picker cylinder, B, reciprocating screen, E, exhaust screen, R, and fan blower, M, arranged and operating in the manner and for the purposes specified.

LOCOMOTIVE COW CATCHERS—Joel Wisner of Aurora, N. Y.: First, I claim the bar or jaw, B, legs, G, feet, J, and teeth, C, when operated by the springs, D, or their equivalent, in combination with the forward end beam of the locomotive.

Second, I claim the stud, H, and joint, I, in combination with the bar, B, when constructed and operated substantially in the manner and for the purposes described.

CUTTING DOVETAILS—E. G. Matthews, of Clear Water, Minnesota Ter. (assignor to Harvey Church, of Troy, N. Y.): I claim, in combination with the fixed stock, Q, the mitering knife, f, and scouring and cleaning knives, e e, as set forth, for forming at one operation the miter and dovetail tongue or groove.

I also claim, in combination with the fixed stock and mitering and dovetailing cutters described, the traversing of the block or board in a clamped condition past the same, for the purpose of having the miter and dovetail formed, as set forth.

CALENDAR CLOCKS—E. P. Monroe, of Albany, N. Y. (assignor to Gilbert H Scribner, of New York City): I claim the displacing of cards for the purpose of enumerating and designating the day said cards being suspended upon wires, as described, and displaced by means of a hand, as set forth, moved and operated by the machinery of the common hour clock or by any other machinery appropriate for the same purpose.

PATCHING BULLETS—Frederick D. Newbury, of Albany, N. Y., Assignor to Richd. Varick De Witt, Jr., of same place: I claim the method of securing a patch upon conoidal or similar bullets by compressing the upper portion of the patch under a thin ledge of the metal of the bullet, substantially as described.

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RE-SAWING LUMBER—S. P. Winne, of Albany, N.Y I claim, first, connecting the slides, G H, of the two roller frames, F F, by arms, K K, as shown and described, for the purpose specified.

Second, I claim connecting the two upper and outer rollers, L, in the frames, F F, to the two lower rollers, O S, in the frames, P R, by means of the rods, f f', arranged as shown, so that a rotary motion is communicated to the lower rollers from the upper ones, and the upper rollers allowed to have an independent lateral movement as described.

[By a peculiar arrangement of feed rollers, plank, or timber of any kind, can be sawed directly through the center, and also into strips or boards of different widths—two different kinds of stuff being sawed at the same time by the same saw. The improvement is ingenious and useful]

SPRINGS FOR VEHICLES—Darius Babcock, of Homer, N. Y. (assignor to Thos. Harrop and Darius Babcock): I claim the combination of the C-springs, B B, and sinuous spring, D, connected by rigid bars, E, to the body of the vehicle, substantially as shown and described.

[This improvement embraces a combination of a C-spring with a "sinuous" spring, whereby a cheap and durable carriage spring is obtained, and the weight of the body of the carriage is brought to bear upon the ends of the axles instead of their center portions.]

FISHING ROD REELS—Edward Deacon, of Brooklyn N. Y., assignor to John Warrin, of New York City: I claim connecting the crank shaft, F, with the reel shaft, E, and also disconnecting it therefrom, by means of the slotted sleeve, placed or fitted upon the shaft, F, and within the socket, C, substantially as shown and described.

[By this improvement in fishing rods, the crank spindle may be readily connected with and disconnected from the reel spindle of the line, whereby the fisherman, in throwing out the line, will lie enabled to do so with greater freedom and ease than with the common line reel.]

MAKING SEAMLESS TUBES—William S. Platt, of Waterbury, Conn., Assignor to W. S. Alfred and Clark M. Platt: I claim so forming the groove upon each sector that the breadth and depth thereof shall gradually diminish from one end to the other, whereby the size of the central hole formed by a set of the said sectors when arranged for operating, shall increase or diminish as the sectors vibrate or rotate, in the manner and for the purpose set forth.

METALLIC BEADS—John R. Wendt, of Boston, Mass.' Assignor to J. R. Wendt and Augustus Rogers, of same place: I do not claim making a piece of metal into a tubular form, nor swaging a piece of metal by dies, when these processes are separately considered, but what I do claim is my improved manufacture of hollow beads of metal as made by the operations of reducing the metal to a tubular form, and that of compressing it axially in dies as specified.

IMPROVED WINDOW BLINDS—Daniel Kelley and Wm. Livingston, of Grand Rapids, Mich.: We claim constructing the slats, D, as shown, and having strips, e, attached to the stiles as described, whereby the slats when closed, will overlap and be flush with each other at each side, and the slats rendered perfectly weather proof and the light excluded.

[This improvement in blinds renders them weather proof and capable of excluding the light entirely. The slats are so formed that when the blind is shut they lap on one another, and be perfectly close together with their surfaces flush. They are also so formed that weather strips may be secured to the stiles of the blind interposed between the ends of the slats and blinds.]

HUSKING CORN—Ezra S. Holmes, of Lockport, N. Y. I do not claim the motive parts of this machine, nor the compound crank, nor the ways, slides and arms, nor the shears, for they have been used before.

I claim, first, the huskers, consisting of the guides, S, q, q, S, S, p, shown in figure 3, and of the hands, a, f, g, Z, Z, Z, C, shown in figure 4, or their equivalents operating in the manner, and for the purpose substantially as described.

I also claim, second, the combination of the huskers, figures 3 and 4, with the shears, figure 2, said combination acting in the manner and for the purpose substantially as described.

DESIGNS.

COOKING RANGES—Charles J. Shepard, of Brooklyn, N. Y.

COOKING STOVES—Jas. E. Stevenson, of Albany, N. Y.

PARLOR COOKING STOVES—Daniel Wilson, of Nashua, N. H., Assignor to the Union Stove Company of same place.

NOTE.—FIFTEEN of the Patents granted last week and contained in the above list, were secured through the "Scientific American Patent Agency."

Architectural Ornaments of Plaster.

A large mansion at the corner of Broad street and Girard avenue, in Philadelphia, presents a great number of ornamental brackets made of ordinary plaster, which have now been in place for four severe winters without the least show of any injury. The brackets are placed under the projecting edge of the roof, and are each four feet long. They received four coats of Silver's Marine Paint, the last two of which were sanded. The house is exposed on all sides, and the result of this experiment, the first of the kind which has come to our knowledge—indicate that this cheap and fragile material may yet be quite extensively employed for such purposes. There are buildings in this city and Brooklyn presenting molded forms on their fronts, the material of which is *principally* plaster, and several patents have been taken for mixtures of the same with coal ashes, blood, and other combining materials to make a harder and stronger stone.

The Ice Crop.

The present winter has been cold throughout the South; and as more or less ice has been secured in each locality, the demand from the North will probably be less than usual this summer. The ice stored by the ice companies here this winter has been about one half million tons, which is more than ever before, and of a better quality than usual.

During the past year 23,730 flasks of quick silver were exported from San Francisco, which, by Custom House valuation, were worth $2,183,185.

Repairing Old Plating Solutions.

MESSRS. EDITORS—As I have experienced much annoyance, as an Electric Plater, from solutions becoming entirely useless after a few months' working of them, I have thought the following recipe would not be unacceptable to some of your readers, who may be engaged in that art. For a long period of time my only plan, when a solution became useless, was to evaporate it, and concentrate or decompose it with sulphuric or hydrochloric acid. This I found to be such a very troublesome and expensive method, to say nothing of inhaling the deadly gases, especially when hydrochloric acid was used, (which produced prussic acid in a pure state.) that I determined to adopt some other plan, if possible. By a careful examination of different solutions, when they had become inert, I became convinced their inertness arose from a loss of cyanogen by evaporation, thus leaving a large amount of free carbonate of potash in the solution, which manifests itself by coating the positive plate with an insoluble crust, not only preventing the cyanogen still in solution from distilling the metal, but causing a great resistance to the galvanic current.

The plan which I have adopted with complete success, is as follows:—Take 1 lb. (Troy) prussiate of potash, and dissolve it in 5 lbs of water, and add 2 lbs. strong sulphuric acid; place this compound in a glass, or, what is better, a lead retort over a slow fire, runing the tube of the retort in a slanting direction five or six inches into the metallic solution. In a few minutes the cyanogen will begin to disengage, and it requires but thirty or forty minutes of rapid ebullition to obtain most of the cyanogen. The retort should be provided with a safety tube at the top, half filled with water, so that should a sudden condensation ensue in the retort, the air would rush in through the tube instead of the metalic solution being drawn up into the retort. The proportion here given will be found sufficient to repair four or five gallons of solution, and put it in excellent order for reworking. This method will be found especially valuable for the cyanides of copper, brass, &c., as the cyanogen is rapidly driven off by the heat necessary to work those solutions. JAMES POWELL.

Cincinnati, O., Feb., 1857.

Liquid Quartz—Artificial Stone

MESSRS. EDITORS—Your attention has recently been particularly called to this subject, and has necessarily led you to further investigation. In your last article upon "Liquid Quartz," you contended (very properly, too,) that the flint in solution should be in proportion of at least fifty per cent. to that of any alkaline solvent agent, used in dissolving it in water as a base for artificial stone and all like purposes—and that you hoped such a long-sought desideratum would ere long be achieved by some one.

To my knowledge, several scientific men are of the opinion that that is already found in the liquid quartz made by Benjamin Hardinge, Esq., of this city; the careful analysis made by them having shown the fact that the quartz in the liquid he makes is in far greater proportion than that you suggested. I am also warranted in stating that it was demonstrated to their satisfaction that Mr. Hardinge, by his apparatus, can manufacture it cheaply and in large quantities. J. HUTCHINSON.

No. 17 Broadway, New York.

Maelstrom.—The Great Whirlpool.

MESSRS. EDITORS—I have been informed by a European acquaintance that the Maelstrom, that great whirlpool on the coast of Norway, laid down in all geographies, and of which we have heard such wonderful stories, has no existence. He told me that a nautical and scientific commission, composed of several gentlemen appointed by the King of Denmark, was sent to approach as near as possible to the edge of the whirlpool, sail around it, measure its circumference, observe its action, and make a report. They went out, and sailed all around and all over where the Maelstrom was said to be, but could not find it; the sea was as smooth where the whirlpool ought to be as any other part of the German ocean.

I have been instructed to believe that the Maelstrom was a fixed fact in the ocean, that its eddy was several miles in diameter, and that ships, and even huge whales were sometimes dragged within its terrible liquid coils, and buried forever "in ocean's awful depths."

Now, Messrs. Editors, I write to you for information on this point. Is the Maelstrom really blotted out of existance by this Danish Commission, or can I still fondly cherish some terrible thoughts of its reality.

New York, 1857. R. R.

[We have heard something respecting the Danish Whirlpool Commission going out and finding the Maelstrom nowhere, but we have not seen their report, and personally, we cannot give our correspondent positive information whether the Maelstrom is choked up or not. Some of our nautical correspondents may be able to throw more light upon the troubled waters.

Colored Spool Cotton.

MESSRS. EDITORS—I wish to call the attention of manufacturers of colored spool cotton to the wants of the public.

It is a notorious fact that colored spool cotton is not so smooth and good as white, and that there are no gradations of size, although much required, also no fast colors. Why cannot cotton thread be colored, so as not to fade, as well as cotton cloth? I suppose it would cost a little more; consequently the makers destroy their business by manufacturing an article entirely unfit for use. Silk thread has to be used, although much dearer, in a great many instances where cotton would be employed if it would not fade. There is a great and general complaint among the ladies and dress makers on this subject.

Any manufacturer who would attend to this matter would insure a reputation and a handsome remuneration. F. D.

[There are many common colors of spool cotton which are more permanent than those of silk, such as green, blue, brown, orange, &c. But black silk thread is more permanent in color than black cotton thread, and as this is the most common colored thread used, it is really the most important. Spool cotton can be dyed as permanent in color as cotton cloth, but to dye a fast black on cotton thread it will cost at least three times more than to dye black silk—weight for weight. The question to which our correspondent directs the attention of spool cotton manufacturers, is one of considerable interest, because they have much yet to learn in this branch of the cotton manufacture, and it is by such hints as the above that they are put in remembrance of their deficiencies.

Mineral Rods.

MESSRS. EDITORS—As you have not stated the authority in your judicious article, page 165, SCIENTIFIC AMERICAN, present volume, on which the use of the "Mineral Rods" are still used in different parts of the country, will you be so kind as to allow me to do so? For more than thirty years I have had more or less experience in the occult sciences; and have experimented on the Nervous System, in connection with Electricity and Magnetism, perhaps as extensively as any other man in this country. And I take it upon myself to say that there is, indeed, and probably will be for some time to come, some good reasons for the use of the so-called "Divining," or "Mineral Rods." This authority is founded in that well-known quality of human nature, which you will find described in Webster's Dictionary, under the term *gullibility*. In this fruitful soil we have the best of reasons for a thousand things that pass under the name of "Mineral Rods," "Clairvoyance," and "Fortune Telling."

The celebrated David Davis, author of "The Manual of Magnetism," and formerly a popular magnetic instrument maker in this city, some years ago, showed me a quantity of these Mineral Rods which he made to supply the demand of trade, and he assured me that the only authority for their use was, as I have stated—*gullibility!*

Hence, I conclude, Mr. Editor, that, as long as this quality of human nature remains, you will find people advocating the use of the mineral rods, and other practices similarly authorized. LA ROY SUNDERLAND.

Boston, Feb. 9, 1857.

Reform in Weights and Measures.

MESSRS. EDITORS—I am glad to find that you are in favor of reforming our *system* (if it can be called a system) of weights and measures. The evils of the present confused and contradictory arrangements are apparent at a glance. It is not only to business and scientific men that they are a nuisance, but our very school-boys feel it acutely. The committing to memory of the various tables of weights and measures is a considerable tax on the time and patience of the learner, which might be more advantageously employed in other studies. And it is the case that whatever the mass of the people have been habituated to in their youth, they think that to be right when they become men; and it does not enter their heads to inquire if this or that might not be amended.

I agree with you that it would not be well to introduce the French terms, but I think that our present terms should not be retained in case of a reformation. Making use of gill, pint, bushel, &c., when they no longer designated the same quantity as at present, would cause endless misunderstanding for a long time to come.

It seems to me that the present system might be advantageously replaced by something like the following:—Fix on some specific length as the unit of lineal measure, if it should happen to be the same as the one now in use, let it keep its name (as a foot, for instance,) let its square be the unit of surface measure, and its cube the unit of solid measure. These several units of measure might be divided into smaller, or raised into higher denominations, decimally, as often as might be deemed advisable. In the same way a unit of weight should be fixed on, and subdivided or multiplied as required by public convenience. No doubt some mistakes would at first arise from the change, especially as our books are adapted to the existing regime, but where is the reform that does not carry with it some drawback. Our posterity at least would derive the full benefit of it. The question ought to be agitated until we arrive at something better than our present methods.

E. M. RICHARDS.

Lebanon, Pa., Feb. 2, 1857.

[The French nomenclature is excessively long and disagreeable, but the quantities represented thereby may perhaps be as unobjectionable as any, and being already adopted as the universal language for abstract scientific and experimental reports all over the world, are deserving of careful consideration. They are essentially as suggested by our correspondent. The *Metre* is a measure of length, equal to one forty-millionth of the earth's circumference measured over the poles (very nearly 39·38091 U. S. inches.) A *Decimetre* is one-tenth of a *Metre*. The *Litre*, a liquid and dry measure of capacity, is equal to one cubic *Decimetre*; and the square and solid measures are all based on equally simple relations to the original *Metre*. The *Killogramme*, the unit of weight, is equal to the weight of one cubic *Decimeter* of distilled water at the temperature of maximum density. All these are, in turn, sub-divided, and increased in ten-fold proportions, so that division and multiplication is easy, and if designated by simple short names, not liable to be confounded with each other, the system has many features to recommend it.

Great Patent Law Case Decided.

An important opinion of the United States Supreme Court was rendered at Washington on the 13th inst., deciding the invalidity of Horace H. Day's interest in the extended patent of E. M. Chaffee. This decision also settled another question which excited considerable interest among the lawyers in this city in 1854. This was an offer by Mr. Chas. O'Conor of $1,000 to any person who would produce an authority for a certain ruling of Judge Betts, in the trial of Day vs. the New England Car Spring Company, described on page 69, vol. 10, SCI. AM. The decision of the Supreme Court, we understand, according to the information transmitted to this city, settles the question against the ruling of Judge Betts and in favor of Mr. O'Conor.

A pound of iron converted into fine spring steel will make 50,000 watch springs.

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New Inventions.

Manufacture of Aluminum.

When the metal aluminum can be manufactured so cheap as to allow of it being employed in the arts like copper, we are of opinion that it will lead to many mechanical improvements, on account of its lightness and anti-corrosive qualities. We are led to hope that it will soon become cheaper, from a short article in the last number of Silliman's *Journal* from its Paris correspondent, J. Nickles. He says :—

"We have more than once spoken of the efforts employed to render the preparation of aluminum an industrial operation. Dumas has just announced to the Academy that this problem is now solved. He has stated that the manufacture is actually carried on by workmen in a small shop in the Faubourg St. Jacques, at Paris, connected with a manufacture of chemical products. The methods have been contrived by H. St. Claire Deville and Morin. It is necessary always to decompose the chlorid of aluminum, and decompose it by sodium, in order to obtain the aluminum.

This chlorid is now made by the direct use of kaolin or even of clay. The chlorid was difficult to manage in a large way, because, after having been formed in vapor. it was often condensed in snowy crystals, rendering it necessary to collect it in chambers and detach it mechanically from the surfaces it coated. There was, first, a loss of the chlorid, the condensation being incomplete; second, danger for the workmen exposed to the respiration of the vapors; third, an enhancement of cost from the interruptions in the operations.

The improvement consists in submitting to a current of chlorine a mixture of alumina, charcoal, and chlorid of sodium; this affords a double chlorid of aluminum and sodium which is volatile and liquifiable, running like water and becoming solid with cold. The preparation goes on uninterruptedly, proceeding with simplicity and regularity, and exacting no other care than what is necessary for the production of the chlorid, the renewal of the preparation for decomposition, and the substitution as soon as cooled, of earthen pots, in which cakes form from the double chlorid that flows in a continued stream.

The chlorid is decomposed in a reverberatory furnace, into which, mixed with bits of sodium, it is introduced. The re-action of the two substances takes place after a few moments, but so quietly that it may be done on a large scale without danger. It leaves the aluminum in plates, globules, or a powder It is separated from the common salt either mechanically or by means of water."

Further Experiments with Bessemer's Iron Process.

Dr. Stephenson Macadam read, at a late meeting of the Scottish Royal Society of Arts. some reports of experiments, which go to show that the process is ruinous to the metal when carried on for a long period, but may be of service in partially decarbonizing the pig, in which case its use is analogous to that of the common finery fire.

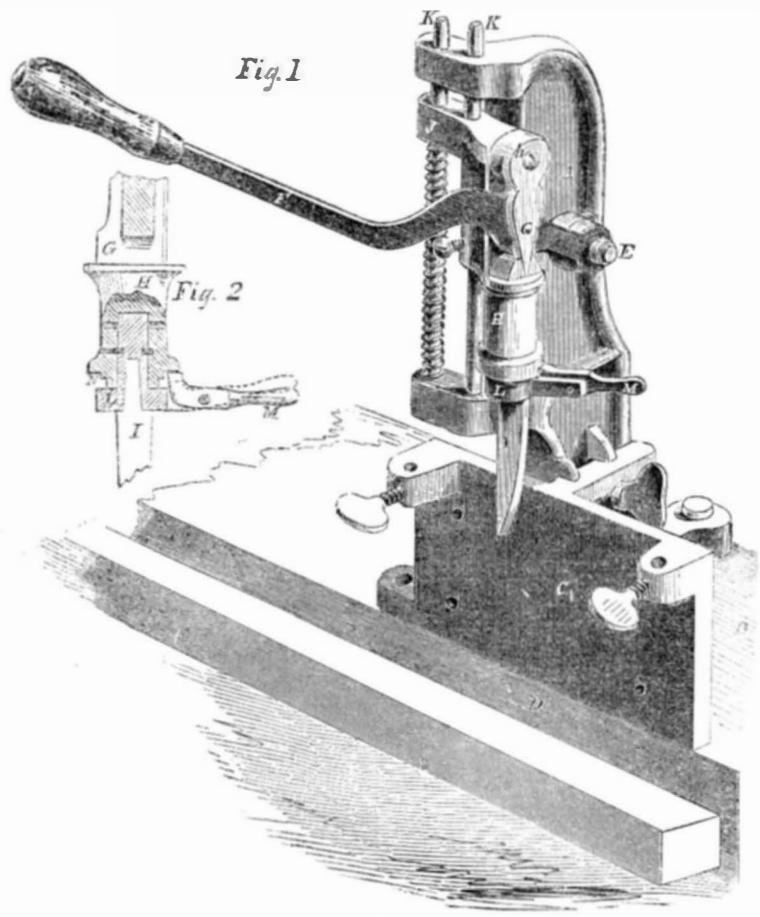
A furnace was charged with 1492 lbs. of No. 2 pig iron, and the air forced in at a pressure decreasing gradually from 15 to 5 lbs. per square inch, for 89 minutes, after which the scintillations still continuing, the furnace was tapped and the iron run into molds. The quantity thus molded together, with what was thrown out by the violence of the ebullitions, was only 630 lbs., showing 862 lbs. to have disappeared in the operation. On attempting to roll the metal it was "hot short," and no subsequent effort at annealing it was successful.

Another furnace was charged with 784 lbs. of No 1 pig, and treated as before, but tapped after 30 minutes. The product or bloom was capable of being rolled, but was still, after re-heating and re-rolling, very crystalline and brittle. This iron was pronounced "cold short."

Another trial with No. 1 pig, treated 24 minutes, gave a result similar to the last. Nos. 1 and 2 iron contain more carbon, are more fusible, and more valuable than numbers 3 and 4, which latter are generally selected for converting, by the ordinary process, into bar iron One trial was made with No. 4 iron, but in 15 minutes the metal settled down in the furnace, and though it was immediately tapped, the iron would not run out, and the furnace had to be taken to pieces to liberate its iron prisoner.

As intimated above, good bar iron was made in the puddling furnace from iron which had been previously boiled a short time only in the Bessemer furnace. This latter experiment, as were most of the others, was at Coes' Malleable Iron Works, near Glasgow.

PORTABLE MORTISING MACHINE.



The accompanying illustration represents the portable Mortising Machine for which a patent was issued to J. R. Perry, on the 4th of November, 1856.

Fig. 1 is a perspective view, and fig. 2 is a vertical section through the center of the cutter stock.

A is a metal frame cast in one piece, with B, the bed. C is the clamp slide for regulating the work to be mortised on the bench, D. The lever, F, or handle, is secured by a joint pin, E, to the frame. G represents jaws through which the lever, F, passes, and in which it is attached to the cutter stock, H. These jaws are secured by a pin, *h*, to the slide, J, which moves up and down on the two fixed guide rods, K K. One of these guide rods has a coiled spring around it, the tension of which re-acts to raise or draw back the chisel after a down stroke is made.

L is the socket of the chisel, I; it is capable of being moved round, to change the position of the cutter. It has a dog, M, with a small handle attached by a fulcrum pin to a projection on the socket, L, as represented by fig. 2. The inner end of this dog or catch takes into notches, N, in the face of the socket and stock, and holds it in place when the chisel is cutting. To move the socket round, or partially so, to change the position of the chisel, the handle, M, is raised up, as shown by the dotted lines, fig. 1; this detaches its catch from the notch in the stock, H, when the socket and chisel may be turned, and then held fast at any point by pressing down on the handle, M. The socket of the chisel is united to the cylindrical stock, H, by a groove made on each, into which some soft metal is poured through a hole made in stock H, for this purpose. They are, therefore, united together in a most simple manner.

The tool or chisel, I, is operated in the usual manner—the work to be mortised being secured in the table D,—and the chisel has the capacity of being changed, rapidly and easily by handle, M, in any position.

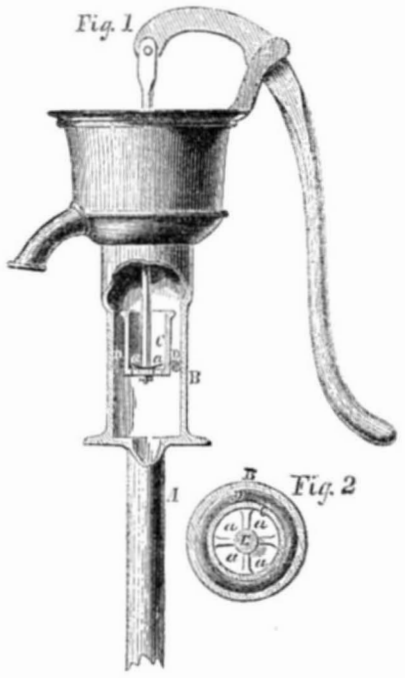
More information may be obtained respecting this machine by letter addressed to Mr. Perry at Port Clinton, Pa.

Elastic Ring Packing Pump.

The accompanying illustration is an elevation partly in section, represented by fig. 1, and a top plan view, fig. 2, of an improvement in Pumps, for which a patent was issued to John Underwood, of Lowell, Mass., on the 9th of December last.

The piston or plunger is of a cylinder form, with the valves inside; and surrounding the plunger as packing there is provided an elastic ring.

A is the suction pipe, and B the cylinder of the pump. C is the cylinder plunger, with valves, *a a a*, secured to the seat, E, of the piston rod, to which they are jointed. D is a ring of elastic packing surrounding the plunger and enabling the plunger to work air-tight in the cylinder, B. A valve is also placed over the exit of the suction pipe. These constitute all the parts to which allusion is required to understand the nature of the invention.



When the plunger, C, is forced down, the valves, *a a*, open, and the water flows up; when raised, the valves close, and the plunger then lifts the water. The elastic ring packing is kept in place by the form of the outside of the plunger, and it can roll up and down with the motion of the plunger, and maintain its position always air-tight. Being elastic, it accommodates itself to any roughness or inequalities of surface in the inside of the pump cylinder, or the outside of the plunger, and thus these two parts of the pump do not require to be turned in a lathe.

If any part of this pump should become deranged, it can be repaired or replaced with facility. This improvement is peculiarly applicable to pumps having stone-ware cylinders, (on which water has no chemical action) because they are generally rough inside, and soon wear out leather or metallic packing, whereas the elastic ring, D, accommodates itself to the inequalities of the surface, and is stated to be far more durable. The invention is applicable to all kinds of pumps, double and single acting, fire engines, etc.

The claim of the patentee can be found on page 115 present volume, Scientific American. More information may be obtained by letter addressed to Mr. Underwood.

Water in Gas Pipes.

A correspondent complains of water which collects in the lower bends of his gas pipes, and assuming the amount of water chemically combined with coal to be only three-fourths of one per cent., argues that water or snow must have been either intentionally or carelessly introduced in the retorts, to produce so large quantities. The evil is a serious one, compelling our large consumers, in some instances, to separate and empty their pipes at some points, every few days. It arises from the presence of small quantities of uncondensed steam or vapor in the gas, which is retained at the ordinary temperatures at which gas is washed, but is deposited when the temperature becomes very much lowered during extreme cold weather. In short, carburetted hydrogen, like atmospheric air, always holds in solution a certain quantity of water, increasing with the temperature. If a certain quantity of either, simply saturated at one temperature, be cooled in a close vessel, or by contact with a cold substance, as with a window pane or pitcher of ice water, it will deposit water, and the evil cannot well be remedied.

Speed of Circular Saws.

A correspondent residing in Ralston, Pa., informs us that in a mill in that place, in which he is interested, there are two circular saws; one thirty inches in diameter, for sawing shingles—speed 1850 revolutions per minte; and the other 34 inches in diameter, for sawing studding. This latter saw was at first geared to run at the rate of 950 revolutions per minute, a speed which was recommended by several machinists. At this speed it was incapable of performing a fair day's work: it turned out only about one-third the work of the shingle machine. The size of its driving pulley was increased to give it a speed of 1200 revolutions per minute, and it now cuts with ease three times the quantity of lumber in the same space of time; "there is no loss of time now experienced in backing out the saw to allow it to recover itself." He is of opinion that the most economical speed to run large circular saws, is from 12,000 to 14,000 feet per minute at their teeth.

Water-Proof Blacking.

There are many persons who cannot wear india rubber shoes on account of having very tender feet. To them a paste blacking capable of rendering their leather boots water-proof, is something of importance. A water-proof paste blacking, manufactured by J. Roemer, of Flushing, L. I., we have found to be a good article for this purpose.

Gas.

The Halls of the Montezumas are about being lighted with gas. The *Extraordinary*, published in English in the City of Mexico, notes the erection of a large establishment, in the outskirts, where gas is to be manufactured for the supply of the city, aided by all the facilities afforded by the most approved machinery, which latter was, at that date, (Dec. 6th,) on the road from Vera Cruz. The surplus heat from the gas works was to be employed in generating steam, which, in turn, was to be employed in driving various manufacturing machinery, so that the works are in fact already the nucleus of a small active village. A Dr. Naphegyi is the projector of this highly creditable enterprise.

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Scientific American.

NEW YORK, FEBRUARY 21, 1857.

Agriculture.—Machines.—Testing Guano.

While our farmers are seeking after and storing up knowledge for their agricultural operations during the next season, we deem it a very appropriate period to direct them to all the sources where genuine, useful, and new information may be obtained. This is one reason why so many new agricultural implements have been illustrated and described in our columns recently, and why our present number contains engravings of two new seed planters, and an improvement in plow harness; and as it is well known that the adulteration of guano is not an uncommon practice, we append some useful information respecting methods to test its qualities.

As guano is very expensive, and as it has come into very general use, some simple method of testing its quality will be of great service to our farmers, because it is not possible to judge correctly of its quality by mere inspection. The following test is taken from the last number of the *Southern Planter* :—

"Pour half an ounce of the guano to be examined into an iron spoon, and place it upon red-hot coals until a white or grayish ash is left, which must be weighed after cooling. The less ash left behind the better is the guano. The best sorts of Peruvian guano yield, from half an ounce, somewhat more than one drachm of ashes (30 to 33 per cent.); whereas the inferior guanos that are now so often offered for sale—for example, Patagonian, African, Saldhanha Bay, and Chili guanos —leave a residue of from 2 1-2 to 3 drachms (60 to 80 per cent.), and those intentionally adulterated a greater quantity of ashes. Of genuine guano, the bad as well as the good, the ash is always white or gray; a yellow or reddish color indicates an adulteration with loam, sand, earth, etc.

This test is very simple, and at the same time very trustworty. It rests upon the fact that the nitrogenous combinations existing in guano, and forming, as has been demonstrated, its most valuable ingredients, undergo combustion and volatilization when subjected to heat. Here, too, the difference of odor during the combustion is characteristic. The vapors from the better specimens have a pungent smell, like spirits of hartshorn, with a peculiar piquancy, almost like old decayed Limbourg cheese, whilst those rising from inferior varieties smell like singed horn-shavings or hair.

The combustion may be undertaken on any hearth, or in any parlor stove, without fear in the latter case that a disagreeable odor will be diffused throughout the room. A brick should be firmly thrust down into the fire, and the spoon laid upon it in such a way that the handle rests upon the brick, and the bow with the guano projects free over the fire. A cork should be fixed on to the extremity of the handle, in order that the hand may not be burnt when brought into contact with the heated spoon."

If guano be adulterated with wood dust charred to a brown color, the above test will not answer, because the charcoal will burn and pass off with oxygen as carbonic acid gas, and thus deceive the anaylist with respect to the amount and value of the volatile matter in the guano.

From fifty to about seventy per cent. of good guano will dissolve in a hot solution of caustic potash, (the lye of potash and a little lime,) and give off a strong smell of ammonia. This is a very simple and good test; and if hydrochloric (muriatic) acid be added in slight excess to the filtered caustic solution it should produce a copious brown crystaline precipitate of uric acid.

We have heard some persons interested in the sale of guano contend that it is chiefly valuable according to the amount of phosphates it contains, while we have heard others assert that it is valuable according to the amount of ammoniacal salts contained in it Agricultural chemists of the highest respectability entertain the latter opinion. Lieber's Analytical Chemists Assistant, published by H. C. Baird, Philadelphia, contains a description of various methods of analysing guano; with these all intelligent farmers can make themselves familiar, and they should do it.

Improving the Ohio River.

This subject is again attracting attention, and many of our Western cotemporaries are discussing the various plans proposed to effect the object. Our constant readers are acquainted with the plan of Charles Ellet, C. E., for maintaining a constant navigable amount of water in the Ohio at all times—by building great dams or reservoirs on the mountainous tributary streams, to supply during the dry months, a sufficient amount of water for navigation. Elwood Morris, C. E., in an article in the January number of the *Franklin Journal*, conceives this to be the most feasible and best plan. He states that the water draining away by the channel of the Ohio river, as measured day by day at Wheeling, Va., by Mr. Ellet, if regulated by reservoirs, is more than adequate to the maintenance of a navigable depth of six feet throughout the year. That six feet depth of navigable water is ample to maintain a permanent steamboat navigation, and also to keep the river clear of stoppage by ice. That by employing receiving and regulating reservoirs of small size, frequently filled and emptied, a navigable depth of five feet could be maintained by means of an outlay of only one million of dollars, and by using six large artificial lakes, a navigable depth of six feet can be permanently maintained by an outlay in reservoirs of twelve millions of dollars. That the reservoirs constructed of imperishable materials will require no repairs, when once properly finished.—The six artificial lakes of the size contemplated, could not fail to exert a material influence in moderating the Ohio river floods.

In regard to *cost*, Mr. Morris arrives at the conclusion, that on the most favorable view of the subject, an outlay of one million of dollars will maintain a current of five feet in the channel of the Ohio; but on the most unfavorable view, a permanent navigation of six feet may be maintained for twelve millions.

Some may object to this method of improving the Ohio river, on account of the magnitude of the works proposed and the cost of keeping them in repair, but this is not the age for tolerating such objections. The simple question that ought to be considered is, "will such improvements pay?" If they will, the sooner such works are commenced the better for all concerned.

Prize to the Inventor of the Minie Rifle Bullet.

The term *Minie-rifle* has led many persons to conclude that there was some peculiarity of construction belonging to fire-arms which went by this name. The fact, however, is, that every rifle in which an expanding bullet is used is a *Minie rifle*; the invention is embraced in the character of the bullet, not the rifle. It was always well known that rifles were more deadly and destructive in warfare than plain-bored muskets, but owing to the difficulty of ramming down a bullet in loading a rifle, (because it is made a little larger than the bore, to fill the spiral creases in the barrel,) soldiers could not load and discharge rapid enough in line; this was the principal reason why the old musket kept its place so long as a weapon of human warfare.

To France, certainly, belongs the credit of first rendering rifles capable of being loaded as rapidly as muskets, and of first introducing them into her army, and subsequently into the British and other armies. This was accomplished by the use of the expanding bullet by Lieut. Minie, of the French army, whom we have always supposed was the first inventor; but recently the British Government has awarded to N. Greener, a mechanic of Birmingham, Eng., £1000 (about $5000) as a prize, for being the first inventor of the Minie bullet. It appears that in 1836 he brought the subject of such bullets before the War Department of that Government; in 1841, in a letter to the London *Times*, and again in 1842, before the Government; and yet slow John Bull jogged on, fat, sleepy, and solemn in warfare, neglecting the invention of Mr. Greener, for nearly twenty years, until aroused to open his eyes, by its extensive introduction into the French army.

Useful Knowledge Respecting the Vegetable Food of Man.

During the early part of this winter, the Rev. H. Wood, of Lowell, addressed the distinguished Dr. S. L. Dana, requesting information relating to the cheapest and best kinds of food. The answer of Dr. Dana has been published in the *Medical World*; it is scientific—as might be expected coming from such high chemical and physiological authority—and it also contains much useful information little known to the community in general. We will endeavor to present the substance of its most important points, because we believe such knowledge should be circulated through every corner of the world, concerning, as it does, the welfare of every human being.

It has been laid down as a law of physiological chemistry that all food serves two distinct purposes: one part for building the body forms the blood out of which comes all the animal tissues; the other part forms fat, and furnishes the fuel by which the animal heat is kept up through the process of breathing. Food contains flesh, blood, and tissue formers in proportion to their amount of nitrogen. When chemistry, therefore, determines the amount of nitrogen in any kind of food, it expresses the relative value of that food for these purposes. The starch, gum, fat, sugar, and water, and occasionally a portion of woody fiber or grain, rarely ministers to the wants of nutrition. These substances are the fuel formers, out of which fat may be formed, which is as essential as blood. Ten parts of fat are equal to twenty-four parts of starch, grape, and milk sugar in heating power.

Life cannot long be maintained by any food that fulfills only one part of the process of nutrition. A man fed only on that food which forms blood and tissue soon dies of starvation, and so does the man that is only fed on fuel-forming food; and if a man is deprived of certain salts, such as common salt, compounds of sulphur, phosphorus, potash, soda, lime, magnesia, and iron, he cannot long survive. And even if fed on all these three classes of substances, he will die of starvation, unless allowed a certain proportion of ready formed fat, in addition to the fat that may be formed out of the other elements of his food.

Nature has taught us the type of our food, viz., milk. It contains the essentials of four great groups of substances on which nutrition in its widest sense depends. The elements of milk are, 1st. *Curd*, which is a blood former; it contains all the nitrogen and all the sulphur. 2nd. *Butter*, which is fat. 3rd. *Sugar*, which is a fuel former or heater. 4th. *Salts*—soluble and insoluble—the earth of bones, potash, soda, and phosphoric acid.

Such are the substances which Nature has prepared for our first food—a mixture of four groups of substances. To suit human wants, according to its age, we should imitate this best natural mixture of those substances designed as the food of man.

In vegetable and animal food there are substances representing those contained in milk. Dr. Dana merely alludes to those of fish and flesh, and states (which is something new to most persons) that the flesh of fish contains the same amount of nutrient matter, as the flesh of oxen. Albumen forms gristle, sinews, membrane, muscle, nails, and is found in the nerve tubes. Fat is a lubricant, assists to form cells, and it forms part and parcel of all the chemical changes which the body undergoes, and is required for more purposes than merely heating the body. Sugar never forms part of the animal tissues, but it performs an important office in the changes of all these tissues. It forms lactic acid, and contributes largely to the formation of fat.

The waste of anything essential to life, and all its healthy functions must be supplied by a like substance. Food, therefore, is nutritious just in proportion as it contains the elements, properly mixed, which go to sustain the body and supply its waste. What is the best and cheapest food for this purpose? This is a great question, and one respecting which much *reliable* information has been wanting.

Wheat, Indian corn, rye, rice, and buckwheat are the principal grains used in our country for food. Wheat holds the highest place in the market, and its finest flour—that which is deprived of most bran—is the dearest, and the most admired. This cherished flour—the costliest—is actually the least valuable for food. The fat and salts of wheat reside chiefly in the bran, and the flour deprived of these, does not contain well mixed nutrient matter.

Dr. Dana places Indian corn and rye above wheat for our food, and he surprises us by giving oatmeal the highest place of all —it contains the greatest amount of albumen, its starch is equal to that of fine wheat flour, and its fat exceeds that of any other cereal grain. Buckwheat and rice are poor articles of food: one pound of beans is equal to three and a half of rice or potatoes. Cabbage contains a great amount of albumen, but no fat, sugar, or salts, but it is excellent for mixing with other substances, such as potatoes, which contain these. Oatmeal cake, bean and pea soup, baked beans, indian meal pudding sweetened with molasses, are the vegetable food, which he esteems to be the best and cheapest for common and general use.

Scientific Examinations in Murder Cases.

Great facilities are afforded by microscopes, chemical tests, and the researches of modern physiology in affirming or disproving circumstantial evidence as to murders. Dr. H. Burdell was found stabbed in his own room in this city on the morning of the 29th ult. There was bad feeling existing between him and his housekeeper, and many circumstances fastened suspicion on her and one of the boarders, but science has removed some of what were at first strong indications of guilt. A dagger was found in her drawer faintly stained with blood; these stains are proved by chemical analysis, to be rust. A very palpable bloody stain on a blue silk dress, proves to be sugar or fruit preserves, and blood found on various clothing about the house, is traced to other sources by the same agency. A knife from the place of business of the suspected boarder, and a newspaper found in his room, showed stains which responded to the chemical tests for blood, and under the microscope showed the blood disks or red globules to be arterial. This will probably weigh somewhat as evidence against him.

It will be recollected that in the investigation which resulted in convicting Dr. Webster of the murder of Dr. Parkman, in Boston, the microscope applied to blood on the shoe of the former, disproved his explanation that it was from butcher's meat, by showing the globules or blood disks to be round instead of longish or egg-formed, as are those of animals.

Hayward's India Rubber Bill.

In the House of Representatives on the 13th inst., Mr. Chaffee, of the Committee of Patents, presented a report recommending the extension of Hayward's india rubber patent for seven years. He moved the previous question on its passage, but other business was interposed to prevent a vote. Messrs. Paine and Edie made an adverse report, in which they assume that Hayward was not the original inventor; that the rights of all the persons manufacturing by the process described, since the expiration of the patent in 1853 are not protected in the bill; and that Hayward has amassed a large amount of wealth by his association with a huge combination.

We are surprised that any member of Congress should have recommended the extension of this patent, it having been public property since 1853, and after all parties interested had such a fair hearing before Mr. Hodges—then Commissioner of Patents—who rejected the application for its extension, and gave his reasons for so doing in a most candid, able and just report. The action of Congress in this case, we hope, will put a complete extinguisher upon this barefaced attempt to impose this monopoly upon the people.

Every pound of cochineal contains 70,000 insects, and from 600,000 to 700,000 pounds are annually exported to Europe for scarlet and crimson dyes. What a destruction of insect life to furnish a coloring material!

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Advice to Inventors—Theory and Practice.

The following remarks are extracted from a lecture of Prof. Rankine, F.R.S., and published in a recent number of the London *Mechanics' Magazine*; they deserve the attention of every inventor and mechanic:—

"Early in the eighteenth century, Newcomen combined the inventions of his predecessors into the atmospheric engine; in which, for about half a century, improvements in detail continued to be made by Potter, Beighton, and others, until, in the hands of Smeaton, it became (considering the general condition of practical mechanics at the time) a very perfect machine in workmanship and mechanism. But all this improvement had been merely *empirical*; and in everything that depended on principle, the steam engine of that period was a most rude, wasteful, and inefficient machine. Then came the time when science was to effect more in a few years than mere empirical progress had done in nineteen centuries. Watt set to work scientifically from the first. He studied the laws of the pressure of elastic fluids, and of the evaporating action of heat, so far as they were known in his time; he ascertained as accurately as he could, with the means of experimenting at his disposal, the expenditure of fuel in evaporating a given quantity of water, and the relations between the temperature, pressure, and volume of the steam. Then reasoning from the data which he had thus obtained, he framed a body of principles expressing the conditions of the efficient and economic working of the steam engine; and the first engine that was made according to those principles, completely succeeded, and fulfilled his anticipations exactly.

His success was owing to this—that before proceeding to put his invention in practice, he had well studied its theory.

It is true that the empirical practice of all arts is more ancient than the theory; and this indeed is necessary, because practice furnishes part of the data on which theory is founded, and propounds questions for theory to solve.

But those who study practice empirically alone, have for their guidance only the structures and machines of former engineers, with the waste of material and loss of power, and other faults involved in them; and, with all the patience and ingenuity which can be applied to those data, considerable improvements can only be attained at the cost of repeated failures, and errors in principle may remain forever undetected; but he who studies the sciences that bear upon his art, has before him, in natural objects, and in the order of the universe, structures in which there is no waste of material, and machines in which there is no loss of power. Thence he learns to see in each work of human art how far it falls short of perfect efficiency; and although perfect efficiency be unattainable, he learns to judge in what direction practice ought to strive in order to approximate to perfect efficiency as near as is possible for human skill.

The theory of *machines* is founded on the principles of *dynamics*, or the science of the relations between motion and force.

Pure mechanism is the name which has been given to the *cinematical* part of the theory of machines, or that which takes into consideration their action, transmitting and modifying motion only, without regard to the force which is at the same time transmitted, such as the parallel motion, the arrangement and proportioning of wheels, and the correct shaping of their teeth.

The *dynamical* part of the theory of machines considers them as transmitting at once, both motion and force, or performing *work*. It treats of the resistance, whether from solids or fluids, which impede the action of machines, the means of regulating that action, and the nature of the sources of motive power, whether animal strength, the gravitation of water, the currents of the air, or the mechanical action of heat. The entire theory of the work of machines is founded on one principle, that of the *conservation of energy*.

Glycerine and its Uses.

A lecture on the above subject was recently delivered before the "Franklin Society," of Providence, R. I., by J. P. Balch. We extract and condense a few sentences taken from the report of it in the *Manufacturers' Journal*, of that city:—

"Glycerine is the base which unites with the fatty acids to form those three remarkable substances—stearine, margarin, and olein, of which substances, combined in various proportions, the fats and fixed oils are composed. This composition of fats was discovered by Chevreul, in the course of long researches, during the first quarter of this century; and in 1853, Berthelot, of Paris, proved synthetically what Chevreul had shown by analysis: combining glycerine with the fatty acids into stearin, margarin, and olein. In the colossal candle manufactory of Price & Co., London, steam, at a temperature of 550 to 600°, is blown through fatty matter in a distillatory apparatus; the fatty acids are separated from the glycerine, and the two distil over separately. Glycerine thus obtained is free from the metallic and other impurities left by the common process of separating it from fats. The applications of glycerine depend mostly on its remarkable solvent powers, its property of absorbing moisture, its bland and soothing character as an application to injured and diseased surfaces, and its nutrient qualities. As a fattener it is likely to be a useful adjunct to cod liver oil. It has also considerable power of preserving animal substances from decay, and fixing their colors, and has been proposed as a means of preserving in their beauty the brilliantly colored fish of tropical seas."

Arrangement of the Crystals of Cast Iron.

Robert Mallet, an Englishman, the author of a work published in London, on Artillery, he affirms that in the "molecular aggregation of crystaline solids, the crystals always arrange and group themselves with their principal axes in lines perpendicular to the cooling or heating surfaces of the solid; that is, in the lines of direction of the heat wave." He assumes, that as a gun, in cooling, radiates heat from the center, outward in all directions, the particles arrange themselves in radial lines ready to be separated on the application of a comparatively slight force, thus possessing least strength in the direction where it is most wanted. He illustrates by the following experiment, which might be readily tried:—"If a cylinder of lead, some four or five inches long, and of about the same diameter, be cast around a cylindrical bar of iron about an inch and a half in diameter, and considerably longer, the lead becoming rapidly consolidated by the contact of cold material interiorly as well as exteriorly, will have a tolerably homogeneous structure, and may be cut into, beaten out, &c., without exhibiting any trace of crystalization. But if one of the ends of the central bar be heated red-hot, and time be allowed for the heat to be conducted along into the interior of the lead, and thence conducted outward in all directions till the heat is nearly up to the melting point of lead—say to about 550° Fah.—and the lead be now sharply struck with a hammer, the whole mass will be found to have a crystaline structure, all the principal axes of the long thin crystals radiating regularly from the center; and by a few blows of the hammer the mass will separate and fall to pieces, so complete are the planes of separation."

As a consequence of this law, it is inferred that every abrupt change in the form of the exterior of any casting, is attended by an equally sudden change in the arrangement of the crystals, accompanied with one or more planes of weakness in the mass. The small cast-iron cylinder of the hydraulic press used in raising the tubes of the Britannia Bridge, failed under the immense pressure, until another form was substituted with a bottom more rounded; and the theory laid down, and to a certain extent established by this writer, would seem to indicate that when angular forms are absolutely required in castings exposed to great strains, it might be expedient to cast the parts in rounded forms, and then turn or plane them to the forms required.

A Large Nugget of Silver.

A mass of pure silver, weighing sixty-five pounds, it is stated, was lately found in one of the mines in the Lake Superior region.

Cold.

At one time it was thought that cold was some particular substance, a sort of nitrous particle floating about in space, but modern science has clearly proved that cold is a negative result from the absence of heat; much in the same way that darkness is the absence of light. Our ideas of hot and cold are formed by comparing the temperature of things with that of our body; when above the heat of the body we say they are warm or hot, and when below it we say they are cold.

The changes of temperature are measured with an instrument called a thermometer, (heat measure,) invented in the year 1600, by Santorio, of Padua; it consists of a glass tube, filled with quicksilver, which contracts with the subtraction of heat, and expands with its addition, sinking in the tube when it is cold and rising when it is hot. In England this instrument is marked like a rule into 212 divisions, called degrees. If we make a mixture of snow and salt, and place the thermometer in it, the quicksilver stands at 0°, or zero, on the scale. Ice begins to melt when the mercury points 32°; the heat of a fine summer's day is about 70°. The warmth of the human body is marked by 96; this is called "Blood Heat." If the rule be placed in boiling water the mercury stands at 212°. We daily witness the effects of heat between these extremes, and are pretty familiar with it up to the temperature of a blast furnace. But we have further to speak of cold, and of those effects which take place when there is, as it were, an entire absence of any heat whatever.

For every mile that we leave the surface of our earth the temperature falls 5°. At forty-five miles distance from the globe we get beyond the atmosphere, and enter, strictly speaking, into the regions of space, whose temperature is 225° below zero; and here cold reigns in all its power. Some idea of this intense cold may be formed by stating that the greatest cold observed in the Arctic Circle is from 40° to 60° below zero; and here many surprising effects are produced. In the chemical laboratory the greatest cold that we can produce is about 150° below zero. At this temperature carbonic acid gas becomes a solid substance like snow. If touched it produces just the same effect on the skin as a red-hot cinder; it blisters the finger like a burn. Quicksilver or mercury freezes at 40° below zero; that is 72° below the temperature at which water freezes. The solid mercury may then be treated as other metals, hammered into sheets, or made into spoons; such spoons, however, would melt in water as warm as ice. It is pretty certain that every liquid and gas that we are acquainted with would become solid if exposed to the cold of the regions of space. The gas we light our streets with would appear like wax; oil would be in reality, "as hard as a rock;" pure spirit, which we have never yet solidified, would appear like a block of transparent crystal. Hydrogen gas would become quite solid, and resemble a metal; we should be able to turn butter in a lathe like a piece of ivory; and the fragrant odors of flowers would have to be made hot before they would yield perfume. These are a few of the astonishing effects of cold.

SEPTIMUS PIESSE.

London, 1857.

Transplanting Large Trees.

A correspondent reports a perfectly successful attempt to remove a considerable number of shade trees to surround a dwelling, each having attained about twenty years' growth. They were Norway firs, Balm of Gileads, hemlocks, larches, horse chestnuts and weeping willows—fifteen in number, each from 35 to 45 feet in hight. They were all cut out with a ball of earth in a frozen state, and every tree was delivered without damage to trunk or limb. The cost—a part having been conveyed on wagons and part on sleds—was from $50 to $100 per tree, warranted to thrive. It is yet too soon to judge the effect on their future growth, but we presume, from the success of other similar efforts, even with larger trees, that they will scarcely suspect they have been moved. It is considered important, under such circumstances, to place each tree in the position relatively to the points of the compass as it stood before.

Defeat of Patent Extension Schemes.

The following, from the Washington correspondence of the Philadelphia *North American*, comments very properly and forcibly on the prospects of reviving and renewing two of the antiquated monopolies which have been urged upon Congress:—

"The vote in the Senate, yesterday, upon the applications of Hussey and McCormick, for the extension of their reaper patents, ought effectually to settle their pretensions now and hereafter. McCormick's original patent being obtained before the existing law, covered all the elementary and substantial principles belonging to former inventions. Still it needed something to complete its practical value, which was found in the two special patents under which he is now working, and realizing a profit of at least $150,000 a-year.

Not satisfied with this success, he has followed Congress for years past, asking a revival of the original patent, which was declared to be public property in 1848. That concession would subject every manufacturer who has applied his own improvements to the reaper, to such a tax as McCormick might impose.

There were 50,000 machines made last year, and a fee of $20 each would insure him a million a year, independent of his income from existing patents. Hussey's reaper stands upon nearly the same principle, though the case has more meritorious circumstances connected with it. Merely technical pleas have been put in by both parties, to carry their point before Congress, and though repeatedly rejected, they have turned up again and again, until their selfish importunity has become both provoking and insulting. It is now hoped that they have bored Congress for the last time; for even some of the members who were disposed to be friendly, have been disgusted by the obtrusive pertinacity with which the object has been pursued. It is estimated that a thousand or fifteen hundred of these reaping machines were used in Pennsylvania during the past year, and that the number will be largely increased during the present one The subject is, therefore, one of interest to the people of the largest wheat-growing State in the Union."

Mysteries of Boiler Explosions.

A correspondent has a large tan yard, and a steam engine attached. The regular attendant was off one day, and the firing was entrusted to an Irishman. One of the workmen happened in, luckily, at an early hour, found the safety valve loaded down with bricks, stones, and what not, and the steam fizzing away at a great rate. He released it, and called the Irishman to account. "An sure," says he, "the stame was all going to waste" If it had burst, there would probably have been conclusive evidence of mysterious explosive gases, electricity, or something of the kind, as the cause.

A New Agricultural Business.

In Piesse's "Art of Perfumery" there is thrown out an idea which is exceedingly pleasing. It is embodied in these words:—"We desire to see flower farms and organized perfumatories established for the extraction of essences and the manufacture of pomade and oils, of such flowers as are indigenous, or that thrive in the open fields of our country. Besides opening up a new field of enterprize and good investment for capital, it would give healthy employment to many women and children. Open air employment for the young is of no little consideration to maintain the stamina of the future generation."

Valuable Door Lock.

Considerable attention has been attracted to the lock on the street door of the house of Dr. Burdell, who was recently so mysteriously murdered in this city. It is Butler's Rotary Lock, the best invention in this line extant The form applied in this instance is capable of being set in several different conditions, at pleasure, in one of which, most in use, it is almost or quite burglar-proof, although opened with the greatest possible ease by a flat key not bigger than a 25-cent piece. We have two of them in use, and can speak authoritatively in their praise. They are manufactured by Valentine & Brother, of this city.

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T. S., of Ga.—We have published all the important facts concerning Ransom's invention with which we are acquainted. We are not aware that he ever took out a patent in this country.

W. S. W., of O.—Silliman's Journal and the Journal of the Franklin Institute we can recommend to your lyceum. The former is published in New Haven, Conn., and the latter in Philadelphia.

W. H. W., of Pa.—There is nothing new in operating a churn dash by means of a crank in the manner you describe. Such churns are common and well known.

W. McK., of N. Y.—A complete set of the Scientific American from Volume 1 up to this time cannot be easily procured.

A. M., of Ind.—We have had many inquiries in regard to S. R. Willmot's machine for sawing down trees, to which we could give no satisfa tory answers. We are not aware that he has any agent in this city.

J. C. A., of Conn.—If you simply take a composition that is already secured by Letters Patent, and employ it for another purpose unknown to the patentee, you could not secure to yourself such use of the composition, and debar the patentee. You would violate the rights of the patentee by any use you might make of his patented composition.

G. W. H., of Ill.—You will please to bear in mind that it makes no difference to us whether you employed us to take out your patent or not in order to gain you a hearing through our columns. We disclaim all notions of the kind. Communications and inventions will receive our most respectful attention at all times, and if we think the interests of the community can be subserved by their publication we shall freely admit them into our columns, come from what source they may. We must decline to publish your communication in regard to "a substitute for leather," for the reason that it does not accord with our views of the necessities intended to be met by our previous article. If you wish to advertise your tanning process in our paper you can do so at the usual rates.

J. M G, of Mo—There is nothing new in the employment of two pistons in the same cylinders as you propose. There is no gain in power in doing so, as the pistons in moving six inches each, or one foot apart, use the same quantity of steam, and give out only the same amount of power as a single piston moving that distance from a fixed cylinder. In regard to the velocity of steam vessels, the requisite power increases as the cube of the velocity, hence eight times the power is required to double the velocity.

L. P. S., of Pa.—Scythe snaths are first turned straight, then steamed and bent in form in rigid molds or dies, where they are retained till cold. Don't know the cost of nibs nor where either are made.

W. H. M., of Mass.—"I want to cast a copper plate on a half circle 7 inches radius and 4 feet long; to be 1 1-2 inches thick along the middle, and 3-4 on each edge. I want to know how to prepare the iron mold so that the casting will be sound." If the difficulty is in the warping of the casting, the mold must be thick and firmly bolted down, but if, as is more probable, it is in the porous and blistered character of the product, the copper must be poured slowly, and very ample provision must be made for the escape of the air previously contained in the cavity. Will some correspondent inform more fully?

S. B., of La.—The term "pise," as applied to iron, whether wrought or cast, is equivalent to the term strong or stiff.

G. W. H., of Ill.—Water can be impregnated with smoke without a force pump, but only to a moderate degree. In ordinary culinary operations it is performed by simply agstating the fluid in contact with a smoky atmosphere.

S. G. B., of O.—"Loadstone" is but a primitive name for what is now generally termed magnetic iron ore or Black Hematite. It is a rich ore, and some of the best irons of commerce are made almost entirely from this form of iron stone, but its magnetic properties are feeble compared with common steel magnets. It abounds in this country and every other. The proprietors of any blast furnace will send you a sample or inform you of its localities.

J. P., of Pa—Paper immersed in black, blue, or green printer's ink, and then dried, forms impression paper, with a little glycerine added.

W. H., of Ga.—The present manner of arranging the lines in writing and reading is certainly defective. Your plan of having the lines red in contrary directions, for example, the first line from left to right, the next from right to left, etc., would remedy the difficulty, and save an immense amount of time daily, to the inhabitants of the globe. As it is a reform by which this whole country is to be benefitted, we would advise that a grand mass meeting be instantaneously called, and a new party formed to carry the change into effect. One of the cardinal principles of the party should be, that no man is elligible to office unless he is perfectly sound on the zig-zag writing question. Your paper is regularly sent.

A. W., of C. W.—We are unacquainted with the book to which you refer, having never seen a copy of it.

G. F. D., of Camden—We do not know the advertiser to whom you refer, and do not consider ourselves responsible for his neglect. Our correspondents frequently write to us to know the reason why some one who advertises in our paper does not attend to their inquiries. It is perfectly apparent to all that we cannot answer such inquiries. We exercise unusual vigilance in keeping out advertisements of a doubtful character, but cannot always know who gets before the public through this medium. A good varnish for engravings and colored prints can be made by dissolving 13 ounces of gum sandarach, 2 of clear mastic, and one of elemi, in alcohol, then adding (when they are dissolved) a very small quantity of camphene. Use a glass vessel well corked to make the varnish, and shake it occasionally until al the gum is dissolved.

J. O, M. C., of Pa—We know no method of "uniting broken mill saws, etc., as substantially as before being broken without drawing the temper." If, as you suggest, it has been practiced in your vicinity, it is an art worth reviving. Brass solder might unite them but would involve the total destruction of the temper at that point.

Haslett & Watson, of Tyrone City, Blair County, Pa., wish to procure machinery for making wooden bowls.

D. E. R., of Pa.—Maj. Gen. Sabine, Vice Prest. of the Royal Society, prepared a work last year on "variations of the magnetic needle," of which see an account on page 131 of our present volume. The reason why the mercury refuses to descend in the tubes of some thermometers, when inverted, we suppose to lie in the smallness or rather the thinness of the aperture. The interiors of such tubes are not round but flat.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Feb. 14, 1857:—

E. R. C., of N. C., $25; P. M., of Ill., $10; L. G., of La., $25; S. T. H., of Ill., $5; G. W. L., of N. J., $30; J. S. T., of Md., $100; D. W. & H. A. L., of N. J., $30; S. B. D., of N. Y., $32; W. R., of N. Y., $30; H. D. F., of Mass. $30; J. P. M., of Mass., $30; T. H., of N. Y., $30; G. C. W., of N. J., $20; W. S. H., of N Y., $30; J. S., of N. Y., $30; O. D. W., of Pa., $150; N. R. B., of N. Y., $10; J. W., of O., $30; I. A. S., of O., $30; J. H. R., of Cal., $100; D. R., of O., $30; A. M., of Pa., $25; H. F. P., of Mich., $39; W. A. F., of Conn., $60; S. B., of Mo., $10; G. G. F., of N. Y., $30; J. F. A., of N. Y., $25; B. A., of Conn., $40; G. A. M., of N. Y., $25; G. W. A., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 14, 1857:

E. R. C., of N. C.; B. T. B., of N. Y.; J. F. A., of N. Y.; R. S. J., of Conn.; B. A., of Conn.; A. S. N. of Pa.; G. A. M., of N. Y.; J. P. R., of Pa.; C. C. Jr., of R. I.; H. F. P., of Mich.; G. W. A., of N. Y.; A. M., of Pa.

Important Items.

☞ COMPLETE SETS OF VOLUME XII EXHAUSTED.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers previous to January 1st (No. 17) are entirely exhausted.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post of fice at which they wish to receive their paper, and the State in which the post office is located.

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Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

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WATER WHEELS—This is to certify that Henry Vanderwater, of Albany, N. Y., has put up one of his improved American Jonval Turbine Water Wheels, under three foot fall, for me, with a strict understanding with him when I purchased it, that he was to grind six bushels of corn in fine meal per hour, or no pay, with 275 inches of water. And I have ground 5 bushels of corn in fine meal in 23 minutes, and certainly believe it to be entirely the best water wheel before the public

Dr. CHARLES DUWALL,
Pawtuxet, Prince George co., Md.
December 9th, 1853. 24 2*

THE WATER-CURE JOURNAL for February contains: Nature of Crises; Thoughts in Spare Minutes; Bringing up Children; Antiscorbutis. Fireside Reading—Russel Smilie's Children; Laws of Health; Chronic Erysipelas; Premature Death—causes; Exercises for School Girls; Rules to Walk; Kinesipathy; Concealed Weapons. The Month—Scarlet Fever; Diet in Relation to Longevity, by Dr. Trall; Fat Food; Home Treatment; The Web of Life, etc. Price 10 cts., or $1 a year. Published by FOWLER & WELLS, 308 Broadway, N. Y. 24 2

THE AMERICAN PHRENOLOGICAL JOURNAL for February contains George Stephenson, the father of railways—his character, with portrait; Value of Phrenology to business men; Inhabitants of south-western Africa (illustrated); Power of Body over Mind; Phrenology and the Lovers; Arctic Life (illustrated); Napoleon and Phrenology; Habits; The "Angel Gabriel;" Chinese Sugar Cane (illustrated with plant and mill); a list of Garden and Flower Seeds. Price 10 cts., or $1 a year. Published by FOWLER & WELLS, 308 Broadway, New York. 24 2

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NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, Office for sale of rights at 27 State street, Boston, and Lowell, Mass, 45 6m*

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters Chucks &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 14 tf

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BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 14 tf

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Science and Art.

How the Solar System was Developed.

"Professor Mitchel's lecture, last evening, was an explanation of Herschel's theory of the manner in which the Universe was created. He stated the leading laws and facts in support of this theory in a most masterly and attractive manner. According to this hypothesis, our solar system was at first a mass of gaseous matter, with a diameter of at least six thousand millions of miles, being the diameter of the orbit of the planet Neptune. By the dissipation of heat and the force of gravitation, in the lapse of ages, it has gradually diminished to the dimension of our sun, the central body, with a diameter of less than a million of miles. The planets were thrown off from the central mass in its rotation from time to time, and the satellites were in like manner thrown off from the planets in their rotation and condensation. Altogether it was one of the most instructive and successful lectures we ever listened to."—[Manufacturers Journal, Providence, R. I., Feb. 6th.

[The above theory is not satisfactory, although its author, La Place, (not Herschel,) was one of the most distinguished astronomers that ever lived; still the most profound men sometimes advance erroneous ideas, and pursue strange fancies, like the philosopher Boyle, spending years in search of a perpetual motion.

It is our opinion that gas was not the primitive, and is not the most natural condition of matter. The evidence of this opinion is to be found in the very small amount of matter existing in a gaseous state in the universe, in comparison with the vast amount of solid and fluid matter.

Science Increasing Longevity.

Dr. Buchanan, in a recent lecture before the Mechanics' Institute at Cincinnati, said that, in the latter part of the sixteenth century, one half of all who were born died under five years of age; the average longevity of the whole population was but eighteen years. In the seventeenth century one half the population died under twelve years. But in the first sixty years of the eighteenth century, one half of the population lived over twenty-seven years. In the latter forty years, one half exceeded thirty-two years of age. At the beginning of the present century, one half exceeded forty years; and from 1838 to 1845 one half exceeded forty-three. The average longevity at these successive periods has been increased from eighteen years in the sixteenth century up to 43·7 by the last reports.

This increase in the duration of life has been caused by improved medical science, improvements in the construction of houses, drainage of streets and superior clothing.

Search for the Course of Ocean Currents.

In the bays of the northern coasts of Spitzbegen, Iceland and Greenland, is found much floating wood, which, after having wandered a long time in the sea, impelled by currents, is at length thrown on shore.

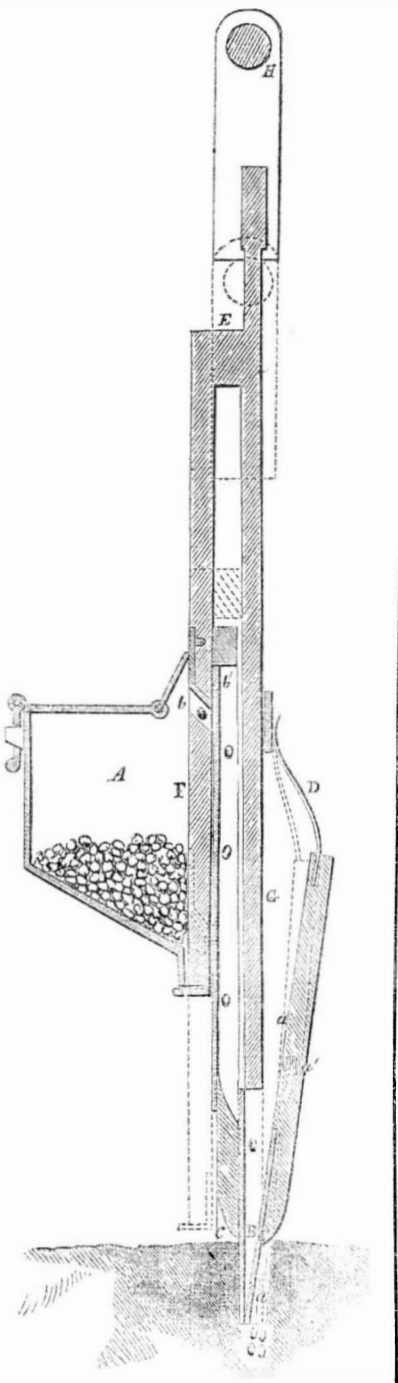
Last year the French frigate *Reine Hortense* made a voyage in the northern Atlantic, and at various points threw overboard painted floats made of pine wood, in the form of short cylinders. In each of these were several holes, enclosing sealed vials containing a descriptive account of the vessel, the latitude and longitude when the float was thrown into the sea, &c. The holes in these cylinders were covered with pitch, and over that with pieces of sheet lead.

The Paris Academy of Sciences calls upon all scientific bodies in Europe and America to report to that Institution, any case where and, when one of these floats has been found by the commander of a vessel. We hope that every American captain who finds one of these floats, will, as soon as possible afterwards, report the circumstance to Lieut. Maury, at the National Observatory, Washington, D. C.

Coating Iron with Copper.

Birmingham, Eng., has patented and put in use, to a small extent, a method of plating, which, it is affirmed, induces the metals to adhere much more tenaciously than any other. It is, in short, that of simple soldering. The sheet iron is "pickled," or thoroughly cleaned in diluted acid, as usual, and covered evenly with brass solder, and this again with borax. The sheet thus prepared after being in a furnace for only about ten seconds, is coated so firmly that it may be rolled, stamped, and manipulated in every desirable manner.

Sherman & Mason's Hand Planter.



This figure is a vertical section of a new Hand Planter for corn and other seed, a patent for which was issued to N. C. Sherman & J. Mason, of Hazel Green, Grant county, Wis., on the 23d of December, 1856.

The improvement in this planter consists in providing a double plunger, composed of two bars which unite at their upper ends into one head or handle, but whose lower portions are separated, one of the bars being made to pass through a seed box and lift a certain quantity of seed therefrom at each stroke, while the other bar serves to open jaws at the foot of the implement for the escape of the seed, and also to press the seed into the ground.

A is the hopper for containing the seed; it may be made of wood or sheet metal. B is a jaw plate attached to its lower end; this plate has a flange, *a*, at each end, forming a three sided box. C is a moveable vibrating jaw formed of plate metal, and attached to a wooden shank that is pivoted between the flanches, *a*, at *a'*, and having a spring, D, bearing against its upper end. This spring, when not acted upon, or overcome by any extraneous power, keeps the lower end of jaw C against the lower end of the stationary jaw B—the jaw C being a little shorter than B. The plunger, E, is formed of two bars, F and G; one (F) passes through the hopper, A, and the other (G) works between the two jaws, B C.

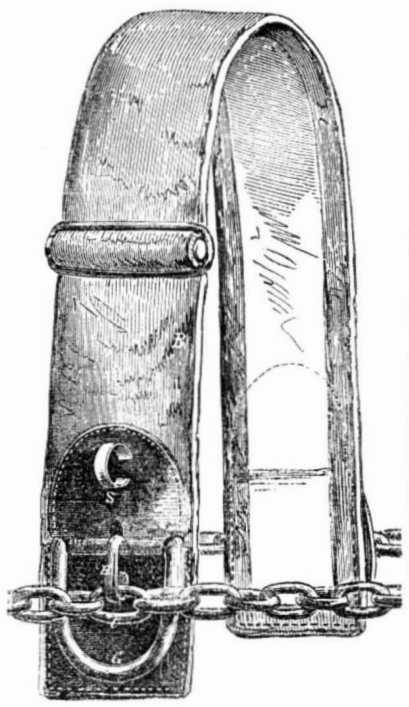
When the plunger is forced downward to its fullest extent, the bar, G, has its lower end flush with the ends of the jaws, or extending a very little beyond them. There is an oblique opening, *b*, in bar F—this bar works closely against the side of the hopper. An opening, *b'*, is also made through the inner side of the hopper. The aperture, *b*, in consequence of its obliquity, forms a pocket for containing the seed, so that when the bar, F, is pushed down it enters among the seed or corn in the hopper, and is filled or charged, and when it rises the seed in the pocket is drawn up above the mass of the seed, and then falls down through the passage, *b'*, to the mouth of the jaws below the plunger bar, G, and is ready to be discharged. By regulating the pocket, *b*, a greater or less amount of seed may be deposited. *c* is a gauge bar attached to the stationary jaw, B. To the upper part of the plunger a handle, H, is secured.

Operation.—The hopper of the implement being filled with corn or other seed, the operator carries it in his hand through the field to be planted. In each spot where the seed is to be planted, the implement is held over it, the plunger, E, drawn upward; the seed with which the pocket *b* is filled then falls down through the way, *b'*, to the lower part of the jaws, which are kept closed by the spring, D; the jaws are then thrust into the loose soil until the gauge, *c*, strikes the surface and arrests their further descent. The plunger bar, G, now comes down, forces open the jaw, C, which turns on its pivot, *a'*, and thrusts the soil to the one side, forming a pocket for the seed, which drops into it, and then the bar, G, presses it into the ground, as represented in the dotted lines in the figure. As the jaws are of a wedge shape, they enter the soil easily, and do not carry any dry soil from the surface with them. The seed is, therefore, always deposited in the moist soil, which ensures its more certain and speedy germination.

This construction of a hand seed planter allows its parts to be made of light material. It is very simple in all its arrangements, and its parts are few, and, apparently, not liable to get out of order.

More information may be obtained respecting it by letter addressed to the patentees.

Back Band Hook for Plow Harness.



This figure is a perspective view of an improved Hook for Plow Harness, for which a patent was issued to Noah Warlick, of Lafayette, Ala., on the 28th of last October.

The figure represents the harness band doubled, as laid over the back of a horse, with one of the harness chains in the nigh hook, and the other chain in the off hook, thus supporting the chains of the traces. The ordinary hooks for this purpose turn outwards, by which arrangement the chain often slips off, is liable to catch objects with which it comes in contact, and is apt to gall the side of the horse.

This improvement consists in constructing the hook turned inward to the band, and surmounting it with a guard, the upper arm of which is the axis of the hook.

B is the band which passes over the back of the animal, and it has a hook, H, (one no seen,) on each end. G is the hook guard; it is made of metal, and its upper side is enclosed in the leather, S, of the strap, and turns in it. The hook is secured to, and is hung loosely on this suspended arm of the guard, which forms its axis, and is represented turned inwards, and inserted in one of the links of chain, C, which passes over the face of the guard, G. The guard prevents the chain from rubbing the sides of the animal, while the rise and fall of the chain in turning at the ends of the furrows will not cause it to slip from the hook. It is also evident that the hook thus arranged is not liable to catch bushes and other objects in the field.

More information may be obtained respecting it by letter addressed to Mr. Warlick.

A small volcano is stated to have broken out in the mountains in Louden county, Va. It has thrown out stones and black smoke to a great hight.

Literary Notices

BLACKWOOD'S MAGAZINE—"Old Ebony" for January just re-published by Leonard Scot & Co. No. 54 Gold street, this city, is a capital number. It contains "The Athelings," part 3; "European Politics," and other seven articles—tales and essays. This magazine maintains its old reputation for originality and ability.

THE AMBROTYPE MANUAL—This is a practical treatise on the art of taking positive photographs on glass, to which is added the method of taking photographic pictures on paper, by N. G. Burgess, practical photographer and manufacturer of chemicals for the art. This treatise is clear, comprehensive and practical throughout, and deserves a wide circulation. It has reached a third edition. Published by J. M. Fairchild & Co., No. 109 Nassau st, this city.

THE BIBLIOTHECA SACRA—The first number of the above-named Theological Quarterly, for this year, contains eight profound and able papers. The first is by R. S. Storrs, Jr., D.D., of Brooklyn, on "Character in the Preacher," is scholarly and yet clear and simple. An article on the "Mosaic Six Days of Geology," by Prof. Barrows, of Andover, exhibits great candor and research. This Review is published by Warren F. Draper, Andover, Mass., is conducted with eminent ability, and has a world-wide reputation.

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